WADE-8067

Mini-ITX Board

User's Manual

Version 1.0

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Appendix A

Appendix B

How to Use This Manual

The manual describes how to configure your WADE-8067 system board to meet various operating requirements. It is divided into five chapters, with each chapter addressing a basic concept and operation of Single Host Board.

Chapter 1: System Overview. Presents what you have in the box and give you an overview of the product specifications and basic system architecture for this series model of single host board.

Chapter 2: Hardware Configuration. Show the definitions and locations of Jumpers and Connectors that you can easily configure your system.

Chapter 3: System Installation. Describes how to properly mount the CPU, main memory and Compact Flash to get a safe installation and provides a programming guide of Watch Dog Timer function.

Chapter 4: BIOS Setup Information. Specifies the meaning of each setup parameters, how to get advanced BIOS performance and update new BIOS. In addition, POST checkpoint list will give users some guidelines of trouble-shooting.

Chapter 5: Troubleshooting. Provide various of useful tips to quickly get WADE-8067 running with success. As basic hardware installation has been addressed in Chapter 3, this chapter will basically focus on system integration issues, in terms of backplane setup, BIOS setting, and OS diagnostics.

The content of this manual is subject to change without prior notice. These changes will be incorporated in new editions of the document. The vendor may make supplement or change in the products described in this document at any time.

Chapter 1
System Overview

1.1 Introduction

Powell Inc., a world-leading innovator in the Industrial PC (IPC) market and a member of the Intel® Communications Alliance, has launched its new WADE-8067 in response to market demand for a simplified embedded system board (ESB) that combines a smaller footprint, lower power consumption, robust computing power and with longevity support.

Based on latest mobile Intel GM45 Express chipset, WADE-8067 takes advantage of Intel Core 2 Duo technologies which has high performance and excellent power management features. WADE-8067not only supports dual display by VGA / DVI / HDMI / LVDS and the third display via PIC-Express expansion slot. In addition, with its display-enriched interface, WADE-8067 can support various multimedia devices.

Built with 45nm Intel® Core™ 2 Duo processor T9400 and Mobile Intel® GM45 Express chipset, WADE-8067 can provide the best solution for multiple applications such as POS, DVR, Mobile Kiosk, Lottery, Gaming and Digital Signage.

1.2 Check List

The WADE-8067 package should cover the following basic items

- ✓ One WADE-8067 Mini-ITX Main Board
- ✓ One SATA Cable
- ✓ One I/O Shield bracket
- ✓ One Installation Resources CD-Title

If any of these items is damaged or missing, please contact your vendor and keep all packing materials for future replacement and maintenance.

1.3 Product Specification

- **Main Processor**
  - Support Intel® Core 2 Due & Celeron M processor
  - CPU clock bus: 667/800/1066 MHz
- **Chipset**
  Intel GM45 GMCH and ICH9ME chipset
- **System BIOS**
  AMI BIOS
- **Main Memory**
  Two 204-pin DDR3 SODIMM socket support up to 8GB dual channel 800/1066 MHz memory
- **Expansion Interface**
  One PCI-Express x 4 slot
- **SATA Interface**
  Four SATA ports
- **Serial Port**
  Support one RS232 and one RS232/422/485
- **USB Interface**
  Support six USB (Universal Serial Bus) ports, four on rear I/O and two on board header for internal devices
- **PS/2 Mouse and Keyboard Interface**
  One header for keyboard and mouse
- **Audio Interface**
  Connector for Mic-In, Line-In and Line-Out
- **Real Time Clock/Calendar (RTC)**
  Support Y2K Real Time Clock/Calendar
- **Watch Dog Timer**
  - Support WDT function through software programming for enable/disable and interval setting
  - General system reset
- **On board VGA**
  - Intel Gen 5.0 integrated graphic engine
  - Intel DVMT5.0
- **On-board Ethernet LAN**
  Two Gigabit Ethernet (10/100/1000 Mbits/sec) LAN ports using Intel 82567LM and 82574L PCI-Expressx1interface GbE Ethernet Controller
- **High Drive GPIO**
  On-board programmable 8-bit Digital I/O interface

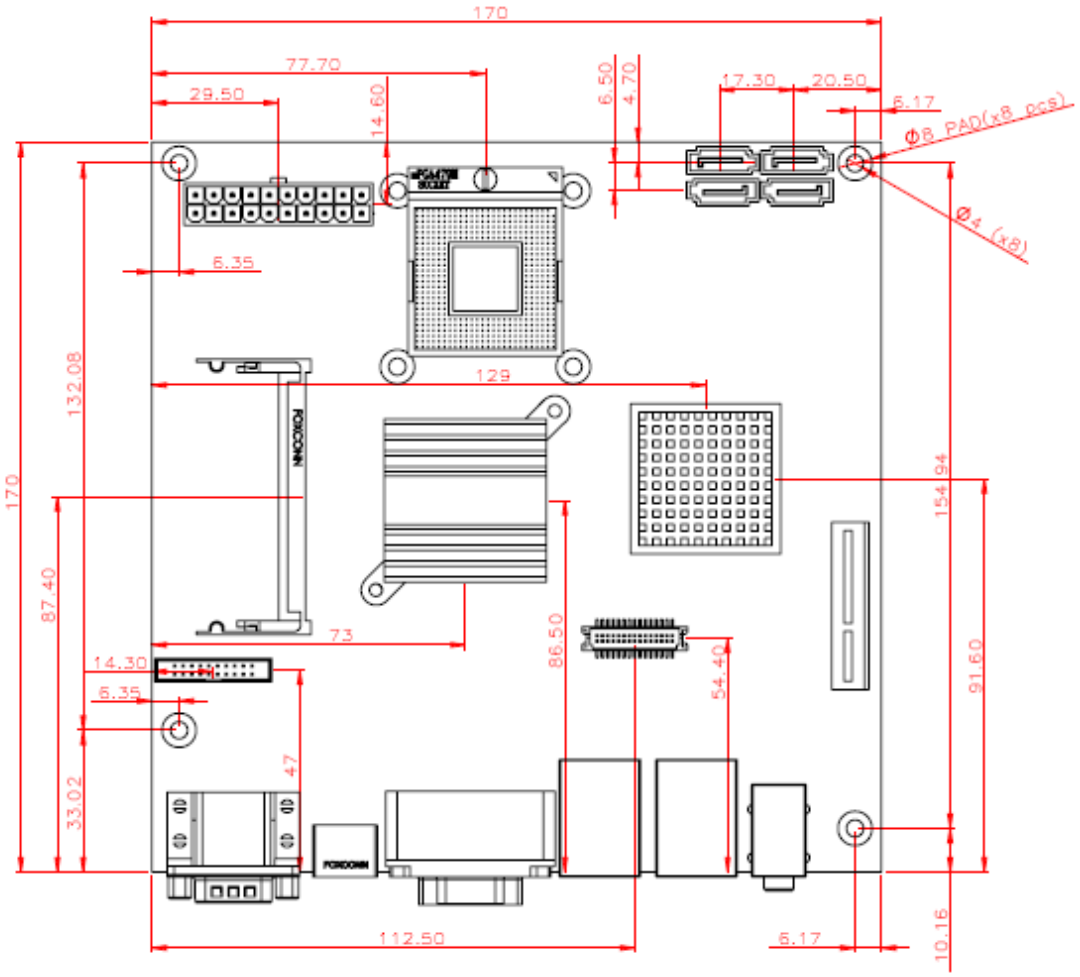
- **Cooling Fans**
  Support one 3-pin power connector for CPU cooler and one 3-pin power connector for system fan
- **System Monitoring Feature**
  Monitor system temperature and major power sources.
- **Outline Dimension (L x W)**
  170mm(6.69'') x 170mm(6.69'')
- **Power Requirements**
  Configuration

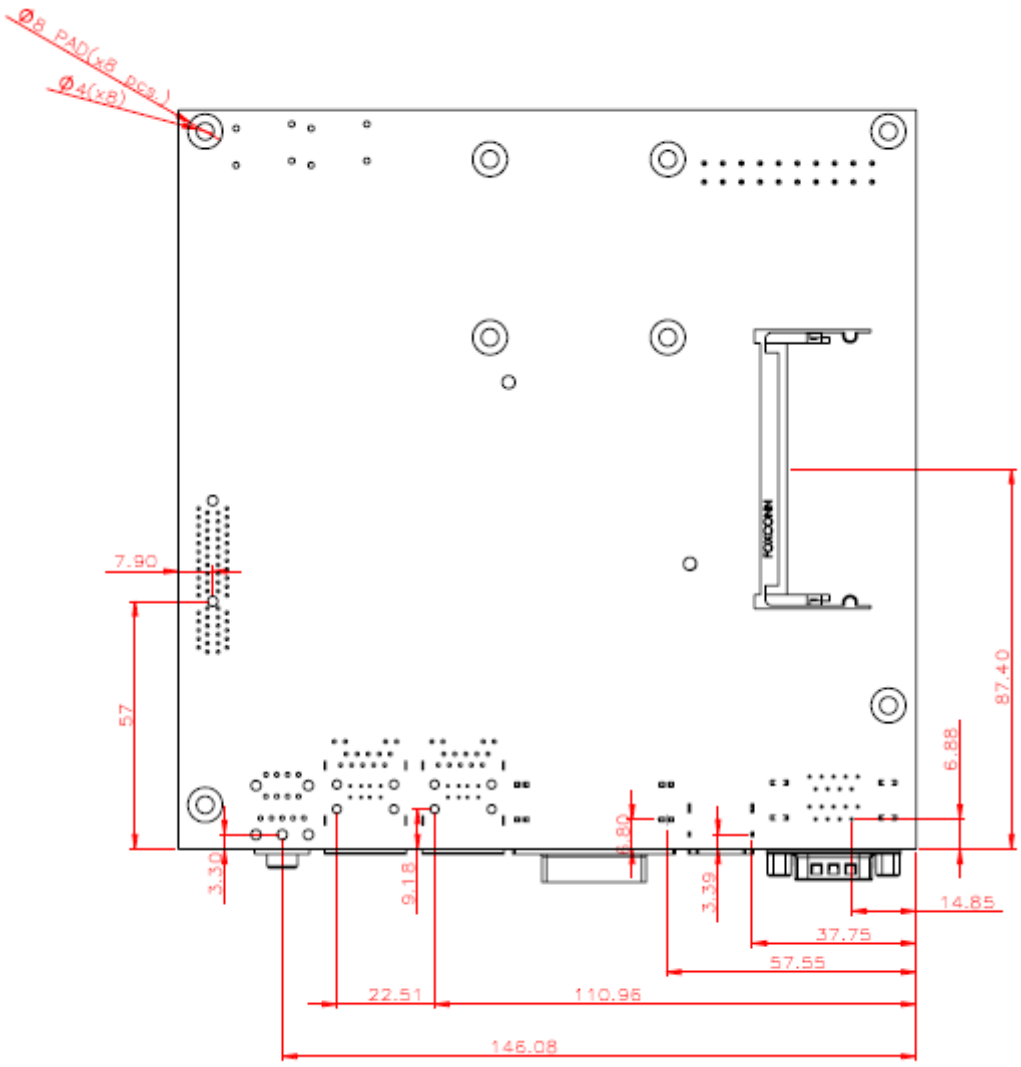
CPU Type	Genuine Intel® CPU @2.53GHz L2:6MB FSB:1066MHz
SBC BIOS	Portwell,Inc. WADE-8067 BIOS Rev.:R1.00.E0 (08012008)
Memory	Unigen DDR3 1066 2GB (SAMSUNG K4B1G0846D)
VGA Card	Onboard Mobile Intel® 4 Series Chipset Family
VGA Driver	Mobile Intel® 4 Series Chipset Version 6.14.10.4969
LAN Card	Onboard Intel®82567LM Gigabit Network Connection
LAN Driver	Intel®82567LM Gigabit Network Version 9.52.9.0
LAN Card	Onboard Intel®82574L Gigabit Network Connection
LAN Driver	Intel®82574L Gigabit Network Version 10.3.42.0
Audio Card	Onboard IDT High Definition Audio CODEC
Audio Driver	IDT High Definition Audio Version 8.7.0.1007
Chip Driver	Intel® Chipset Device Software Version 8.7.0.1007
USB 2.0 Driver	Intel® ICH9 Family USB2 Enhanced Host Controller Version 8.3.0.1011
SATA HDD	WD WD1500ADFD 150GB
CDROM	LITE-ON LH-20A1S DVD-RW
Power Supply	Portwell,Inc PW-330ATXE-12V

Item	Power ON	Full Loading 10Min	Full Loading 30Min
CPU +12V	**0.53A**	**0.51A**	**0.49A**
System +12V	**0.20A**	**0.28A**	**0.17A**
System +3.3V	**0.16A**	**0.22**	**0.23A**
System +5V	**1.96A**	**3.02A**	**3.16A**

- **Operating Temperature**
  0 °C ~ 60 °C
- **Storage temperature**
  -20 ~ 80 °C
- **Relative Humidity**
  0% ~ 90%, non-condensing

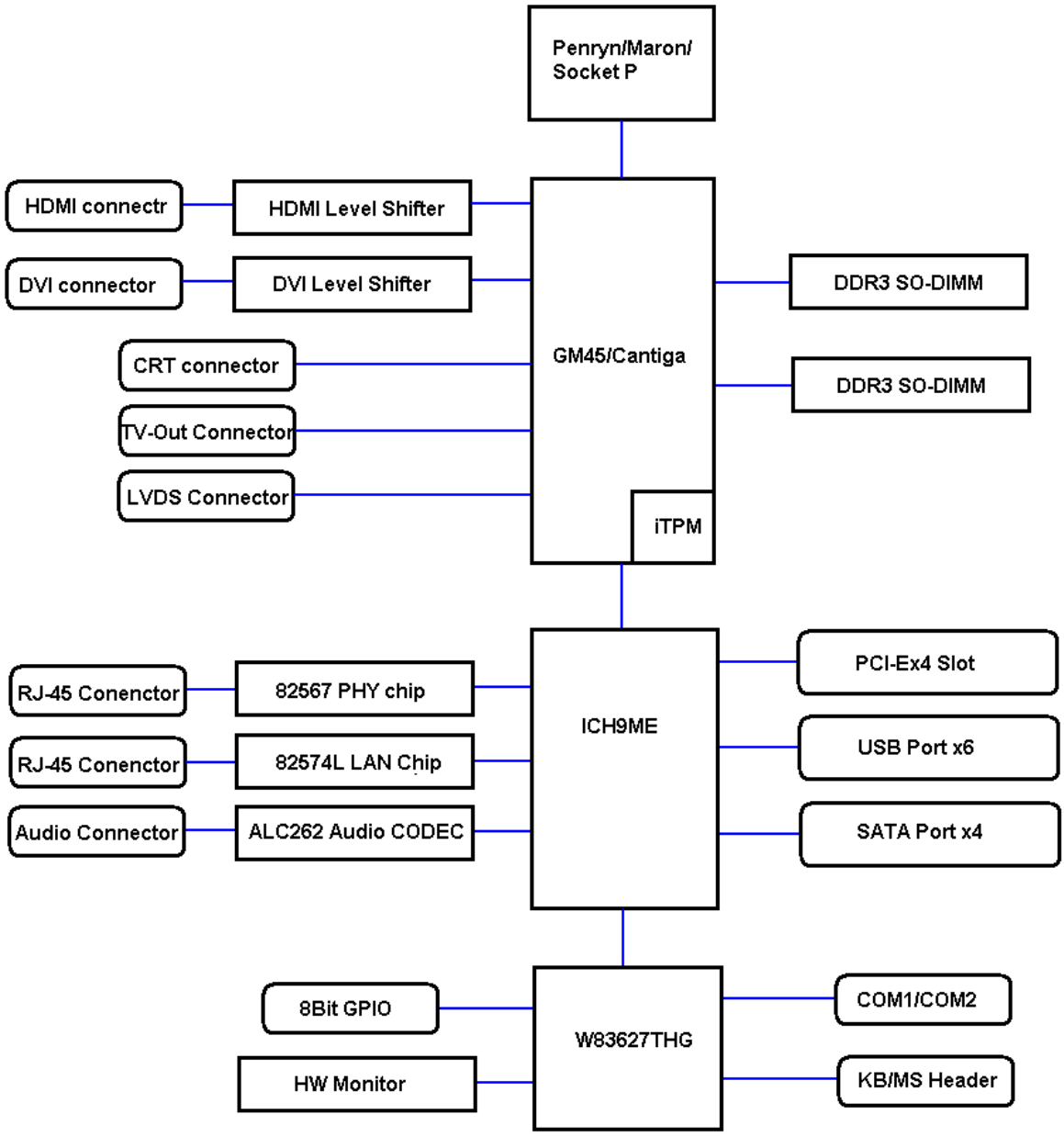
1.3.1 Mechanical Drawing




Ø8 PAD(x8 pcs.)
Ø4(x8)
FOXCONN
7.90
57
87.40
6.88
3.30
9.18
3.80
3.39
14.85
37.75
57.55
22.51
110.96
146.08

1.4 System Architecture

All of details operating relations are shown in WADE-8067 System Block Diagram.



WADE-8067 System Block Diagram

Chapter 2
Hardware Configuration

This chapter gives the definitions and shows the positions of jumpers, headers and connector. All of the configuration jumpers on WADE-8067 are in the proper position. The default settings are indicated with a star sign (★).

2.1 Jumper Setting

In the following sections, **Short** means covering a jumper cap over jumper pins; **Open** or **N/C** (Not Connected) means removing a jumper cap from jumper pins. Users can refer to Figure 2-1 for the Jumper allocations.

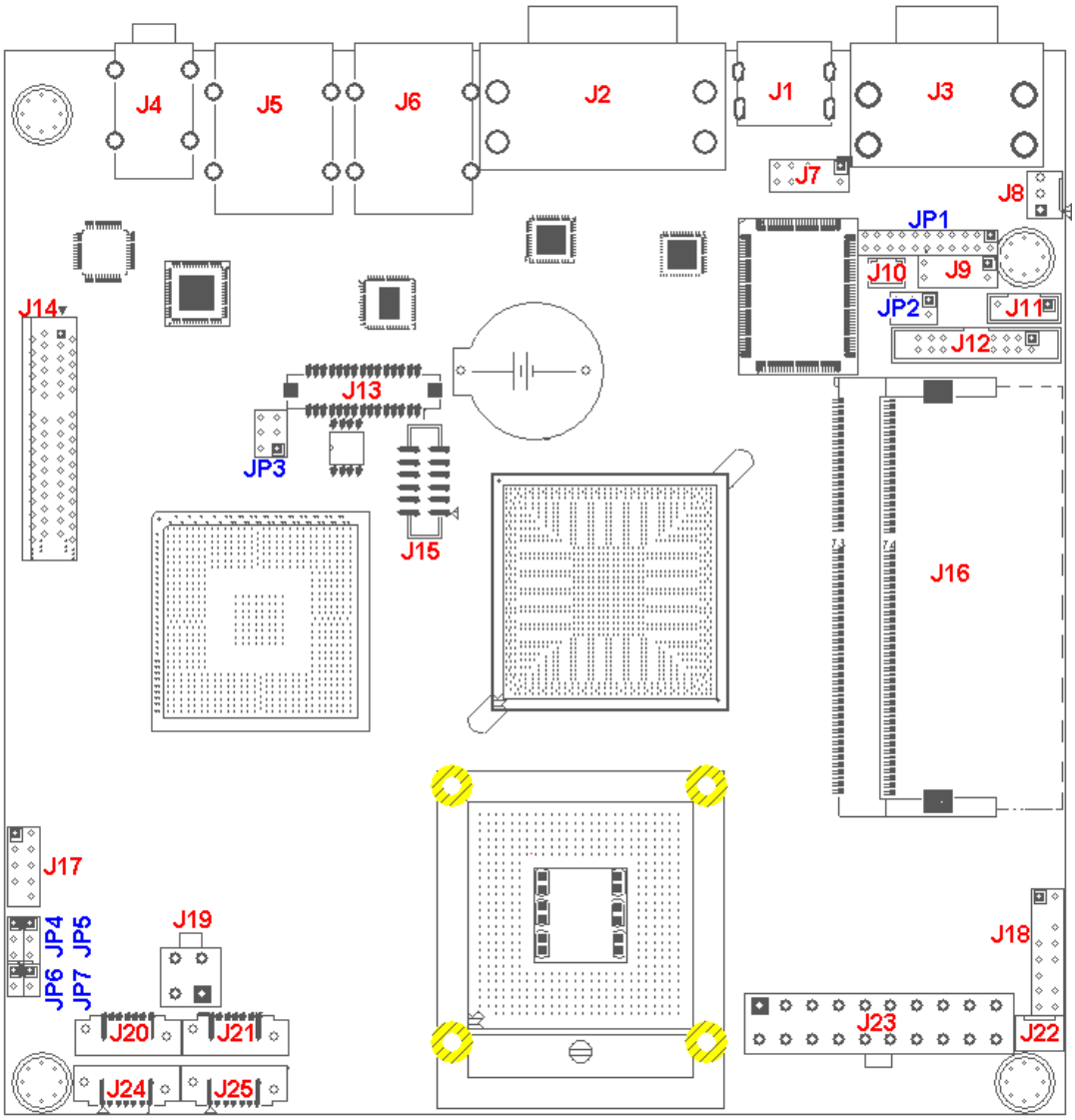


Figure 2-1 WADE-8067 Jumper and Connector Locations

JP1 : COM2 Communication Protocol selection

JP1	Function
5-6,9-11,10-12,15-17,16-18 short	RS-232 ★
3-4,7-9,8-10,13-15,14-16,21-22 short	RS -422
1-2,7-9,8-10,19-20	RS-485

JP2 : LVDS panel Back Light signal level selection

JP2	Function
1-3, 2-4	+5V, Active high ★
1-3, 4-6	+12V, Active high
3-5,2-4	+5V, Active low
3-5, 4-6	+12V, Active low

JP3 : LVDS panel VDD supply voltage selection

JP3	Function
1-2	VDD=+3.3V ★
3-4	VDD=+12V
5-6	VDD=+5V

JP4 : Slave RTC Reset

JP4	Function
1-2	Charge ★
2-3	Clear ME registers in the CMOS

JP5 : RTC clear Jumper

JP5	Function
1-2	Charge ★
2-3	Clear RTC CMOS

2.2 Connector Allocation

I/O peripheral devices are connected to the interface connectors

Connector Function List

Connector	Description	Remark
J1	Type A HDMI connector	
J2	Upper connector: CRT connector; Lower connector: DVI-D connector	
J3	Upper DB9 connector: COM2 port. Lower DB9 connector: COM1 port.	
J4	Audio connectors: Upper hole (light blue): header phone/speaker. Middle hole (lime): head phone/speaker. Lower hole (pink): Micro phone.	
J5	LAN2. Ethernet controller is 82574L. W/O WOL. With USB port 2, 3.	
J6	LAN1. Ethernet controller is ICH9M with 82567LM PHY. With USB port 0, 1	
J7	PS/2 Keyboard and mouse header	
J8	System FAN connector	
J9	8 bit GPIO header	
J10	Case open monitor header	
J11	LVDS panel back light inverter header	
J12	LPC interface or external TPM header	
J13	LVDS panel header	
J14	PCI-Express x4 connector	
J15	TV header (Reserved)	
J16, J27	DDR3 SO-DIMM connector(Reserved)	
J17	USB port 4, 5	
J18	Chassis front panel connector	
J19	CPU +12V main power connector.	
J20	SATA channel 4	
J21	SATA channel 0	
J22	CPU FAN connector	
J23	ATX power connector	
J24	SATA channel 5	
J25	SATA channel 1	

Pin Assignments of Connectors

J1 : HDMI Connector

PIN No.	Signal Description
1	TMDS DATA2+
2	GND
3	TMDS DATA2-
4	TMDS DATA1+
5	GND
6	TMDS DATA1-
7	TMDS DATA0+
8	GND
9	TMDS DATA0-
10	TMDS CLOCK+
11	GND
12	TMDS CLOCK-
13	NC
14	NC
15	HDMI DDC CLOCK
16	HDMI DDC DATA
17	GND
18	VCC (Max 100mA)
19	Hot plug detection pin

J2 : upper connector: CRT Connector

PIN No.	Signal Description	PIN No.	Signal Description	PIN No.	Signal Description
1	RED	6	GND	11	NC
2	GREEN	7	GND	12	CRT DDC DATA
3	BLUE	8	GND	13	HSYNC
4	NC	9	5V (1.5A)	14	VSYNC
5	GND	10	GND	15	CRT DDC CLOCK

J2 : Lower connector: DVI-D Connector

PIN No.	Signal Description	PIN No.	Signal Description	PIN No.	Signal Description
1	TMDS TX2-	9	TMDS TX1-	17	TMDS TX0-
2	TMDS TX2+	10	TMDS TX1+	18	TMDS TX0+
3	GND	11	GND	19	GND
4	NC	12	NC	20	NC
5	NC	13	NC	21	NC
6	DVI DDC CLOCK	14	5V (750mA)	22	GND
7	DVI DDC DATA	15	GND	23	TMDS CLOCK+
8	NC	16	Hot Plug Detection	24	TMDS CLOCK-

J3 : COM1 & COM2 connector

PIN No.	Signal Description	PIN No.	Signal Description
1	DCD	6	DSR
2	RXD	7	RTS
3	TXD	8	CTS
4	DTR	9	RI
5	GND		

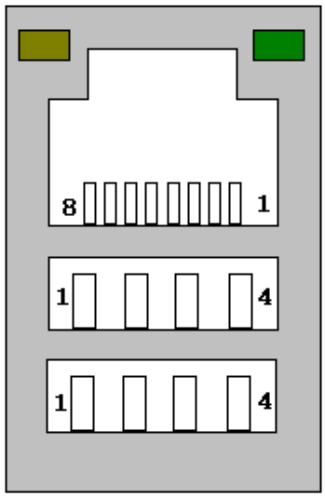
Note: COM1 under COM2.

J4 : Audio COnnector

PIN No.	Signal Description
Light blue	Speaker / Header phone
Lime	Speaker / Head phone
Pink	Micro phone

J5, J6 : RJ-45 + 2x USB Connector

USB PIN No.	Signal Description
1	USB Power(5V)
2	USB DATA-
3	USB DATA+
4	USB GND
RJ-45 PIN No.	**Signal Description**
1	MDIA+
2	MDIA-
3	MDIB+
4	MDIC+
5	MDIC-
6	MDIB-
7	MDID+
8	MDIB-



Note: USB ports in J5 are port 2, 3; USB ports in J6 are port 0, 1.

J7 : PS/2 Keyboard and mouse connector

PIN No.	Signal Description	PIN No.	Signal Description
1	Mouse Data	2	Keyboard Data
3	KEY	4	KEY
5	GND	6	GND
7	VCC	8	VCC
9	Mouse Clock	10	Keyboard Clock

J8, J22 : 12V DC Fan Connector

PIN No.	Signal Description
1	GND
2	Power pin
3	Speed pulse output

J9 : General Purpose I/O Connector

PIN No.	Signal Description	PIN No.	Signal Description
1	Input bit 0	2	Output bit 4
3	Input bit 1	4	Output bit 5
5	Input bit 2	6	Output bit 6
7	Input bit 3	8	Output bit 7
9	GND	10	5V

J10 : Case open minitor Connector

PIN No.	Signal Description
1	CASEOPEN#
2	GND

J11 : LVDS Panel Back Light Inverter Power Connector

PIN No.	Signal Description
1	Back light enable signal
2	GND
3	+12V
4	GND
5	+5V

J12 : LPC interface or external TPM header

PIN No.	Signal Description	PIN No.	Signal Description
1	33MHz PCI clock	2	GND
3	L_FRAME#	4	NC
5	Platform Reset#	6	+5V
7	L_AD3	8	L_AD2
9	+3.3V	10	L_AD1
11	L_AD0	12	GND
13	NC	14	NC
15	3.3V Standby	16	Serial IRQ
17	GND	18	CLOCKRUN#
19	NC	20	L_DRQ1#

J13 : LVDS Panel Interface Connector

PIN No.	Signal Description	PIN No.	Signal Description
2	LVDSA_DATA0-	1	LVDSA_DATA0+
4	LVDSA_DATA1-	3	LVDSA_DATA1+
6	LVDSA_DATA2-	5	LVDSA_DATA2+
8	LVDSA_DATA3-	7	LVDSA_DATA3+
10	LVDSA_CLK-	9	LVDSA_CLK+
12	LVDSB_DATA0-	11	LVDSB_DATA0+
14	LVDSB_DATA1-	13	LVDSB_DATA1+
16	LVDSB_DATA2-	15	LVDSB_DATA2+
18	LVDSB_DATA3-	17	LVDSB_DATA3+
20	LVDSB_CLK-	19	LVDSB_CLK+
22	LVDS_DDC_CLOCK	21	LVDS_DDC_DATA

24	NC	23	GND
26	GND	25	GND
28	VDD	27	VDD
30	VDD	29	NC

J14 : PCI-Express x4 connector

PIN No.	Signal Description	PIN No.	Signal Description
B1	+12V	A1	NC
B2	+12V	A2	+12V
B3	+12V	A3	+12V
B4	GND	A4	GND
B5	SMBUS CLK	A5	NC
B6	SMBUS DATA	A6	3.3V pull high
B7	GND	A7	NC
B8	3.3V	A8	+3.3V
B9	GND	A9	+3.3V
B10	3.3V standby	A10	+3.3V
B11	WAKE UP#	A11	PLT_RST#
B12	NC	A12	GND
B13	GND	A13	PCIE_CLOCK+
B14	PCIE_TX0+	A14	PCIE_CLOCK-
B15	PCIE_TX0-	A15	GND
B16	GND	A16	PCIE_RX0+
B17	NC	A17	PCIE_RX0-
B18	GND	A18	GND
B19	PCIE_TX1+	A19	NC
B20	PCIE_TX1-	A20	GND
B21	GND	A21	PCIE_RX1+
B22	GND	A22	PCIE_RX1-
B23	PCIE_TX2+	A23	GND
B24	PCIE_TX2-	A24	GND
B25	GND	A25	PCIE_RX2+
B26	GND	A26	PCIE_RX2-
B27	PCIE_TX3+	A27	GND
B28	PCIE_TX3-	A28	GND
B29	GND	A29	PCIE_RX3+
B30	NC	A30	PCIE_RX3-
B31	NC	A31	PCIE_GND
B32	GND	A32	+3.3V

J17 : Internal USB connector, port 4,5

PIN No.	Signal Description	PIN No.	Signal Description
1	+5V	2	+5V
3	USB4-	4	USB5-
5	USB4+	6	USB5+
7	GND	8	GND
9	KEY	10	GND

J18 : Chassis Front Panel Connector

PIN No.	Signal Description	PIN No.	Signal Description
1	PC speaker-	2	Power LED+
3	Key	4	Key
5	Key	6	Power LED-
7	PC speaker+	8	NC
9	Power switch+	10	NC
11	Power switch-	12	Key
13	System reset+	14	SATA LED+
15	System reset- (GND)	16	SATA LED-

J19 : +12V power input Connector

PIN No.	Signal Description	PIN No.	Signal Description
1	GND	2	GND
3	+12V	4	+12V

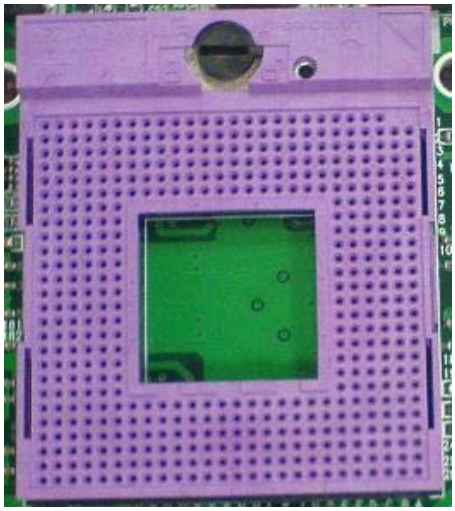
Chapter 3
System Installation

This chapter provides you with instructions to set up your system. The additional information is enclosed to help you set up onboard PCI device, handle Watch Dog Timer (WDT) and operation of GPIO in software programming.

3.1 Intel® Socket P 45nm (478Pin) Processor

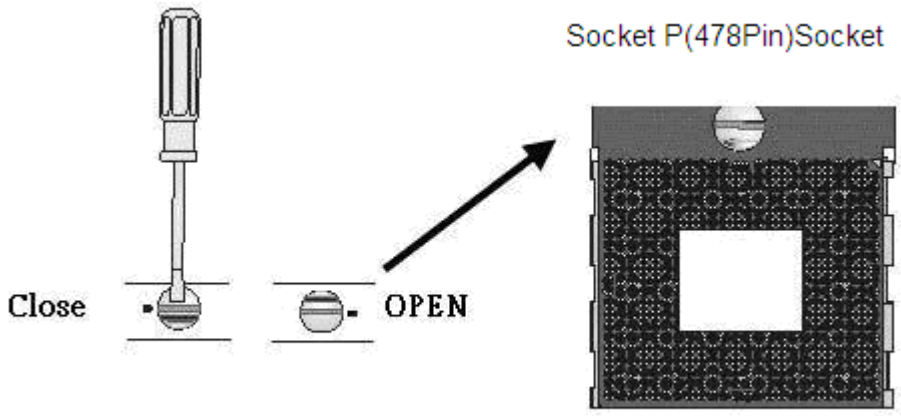
Installing Intel Socket P CPU on actuator (for 45nm 478 Pin Processor)

1) Make sure to loosen the latch of actuator at correctly position (Open).



2) Align the processor pins with pinholes on the socket. Make sure that the notched corner or dot mark (pin 1) of the CPU corresponds to the socket's bevel end. Then press the CPU gently until it fits into place. If this operation is not easy or smooth, don't do it forcibly. You need to check and rebuild the CPU pin uniformly.

3) Turn the latch of actuator to lock processor chip into the socket once CPU fits.



Removing CPU

1) Unlock the cooling fan first.
2) Unlock the latch of CPU Socket to open position.
3) Carefully lifts up the existing CPU to remove it from the actuator.
4) Follow the steps of installing a CPU to change to another one or drive latch to close the opened actuator.

Configuring System Bus

WADE-8067 will automatically detect the CPU FSB 667/800/1066MHz used. CPU speed of Intel 45nm Core 2 Duo & Celeron M Processor for Mobile can be detected automatically.

3.2 Main Memory

WADE-8067 provides 2 x 204-pin SO-DIMM sockets which supports DDR3 800/1066 MHz as main memory, Non-ECC (Error Checking and Correcting), non-register functions. The maximum memory size can be up to 8GB capacity.

For system compatibility and stability, do not use memory module without brand. Memory configuration can be either one double-sided DIMM in either one DIMM socket or two single-sides SO-DIMM in both sockets.

Watch out the contact and lock integrity of memory module with socket, it will impact on the system reliability. Follow normal procedures to install memory module into memory socket. Before locking, make sure that all modules have been fully inserted into the card slots.

Dual Channel DDR3 SO-DIMM

Dual Channel DDR3 memory technology doubles the bandwidth of memory bus. Adequate or higher bandwidth of memory than processor would increase system performance. To enable Dual Channel DDR3 memory technology, you have to install dual identical memory modules in both memory sockets. Following tables show bandwidth information of different processor and memory configurations.

CPU FSB	Bandwidth
1066MHz	8.5GB/s
800MHz	6.4GB/s

Memory Frequency	Dual Channel DDR Bandwidth	Single Channel DDR Bandwidth
1066MHz	17GB/s	8.5GB/s
800MHz	12.8GB/s	6.4GB/s

Note:
To maintain system stability, don't change any of DRAM parameters in BIOS setup to upgrade system performance without acquiring technical information.

3.3 Installing the Single Board Computer

To install your WADE-8067 into standard chassis or proprietary environment, please perform the following:

Step 1 : Check all jumpers setting on proper position
Step 2 : Install and configure CPU and memory module on right position
Step 3 : Place WADE-8067 into the dedicated position in the system
Step 4 : Attach cables to existing peripheral devices and secure it

WARNING

Please ensure that SBC is properly inserted and fixed by mechanism.

Note:
Please refer to section 3.3.1 to 3.3.4 to install INF/VGA/LAN/Audio drivers.

3.3.1 Chipset Component Driver

The chipset on WADE-8067 is a new chipset that a few old operating systems might not be able to recognize. To overcome this compatibility issue, for Windows Operating Systems such as Windows XP/Vista, please install its INF before any of other Drivers are installed. You can find very easily this chipset component driver in WADE-8067 CD-title.

3.3.2 Intel Integrated Graphics GMCH Chip

Using Intel Gen 5.0 integrated graphic engine is the result of new design approach to optimize the shared memory architecture while maintaining the cost benefits of integration through Dynamic Video memory technology.

With no additional video adaptor, this onboard video will usually be the system display output. By adjusting the BIOS setting to disable on-board VGA, an add-on PCI Express by 4, VGA Card can take over the system display.

Drivers Support

Please find GM45 GMCH driver in the WADE-8067 CD-title. Drivers support Windows XP and Vista.

3.3.3 Intel Gigabit Ethernet Controller

Drivers Support

Please find Intel 82574L & 82567LM LAN (J5 & J6) driver in /Ethernet directory of WADE-8067 CD-title. The drivers support Windows XP and Vista.

LED Indicator (for LAN status)

WADE-8067 provides two LED indicators to report Intel 82574L & 82567LM Gigabit Ethernet interface status. Please refer to the table below as a quick reference guide.

<table>
<tr><th rowspan="2">82574L/82557LM</th><th rowspan="2">Color</th><th rowspan="2">Name of LED</th><th colspan="3">Operation of Ethernet Port</th></tr>
<tr><th colspan="2">Linked</th><th>Active</th></tr>
<tr><td>Status LED</td><td>Green</td><td>LAN Linked & Active LED</td><td colspan="2">On</td><td>Blinking</td></tr>
<tr><td rowspan="2">Speed LED</td><td>Orange</td><td rowspan="2">LAN speed LED</td><td>Giga Mbps</td><td>100 Mbps</td><td>10 Mbps</td></tr>
<tr><td>Green</td><td>Orange</td><td>Green</td><td>Off</td></tr>
</table>

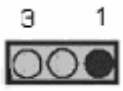
3.3.4 Audio Controller

Please find Realtek ALC262 Audio driver form WADE-8067 CD-title. The drivers support Windows XP and Vista.

3.4 Clear CMOS Operation

The following table indicates how to enable/disable Clear CMOS Function hardware circuit by putting jumpers at proper position.

JP5 : RTC clear Jumper



JP5	Function
1-2	Charge (Normal Operation) ★
2-3	Discharge (Clear CMOS contents)

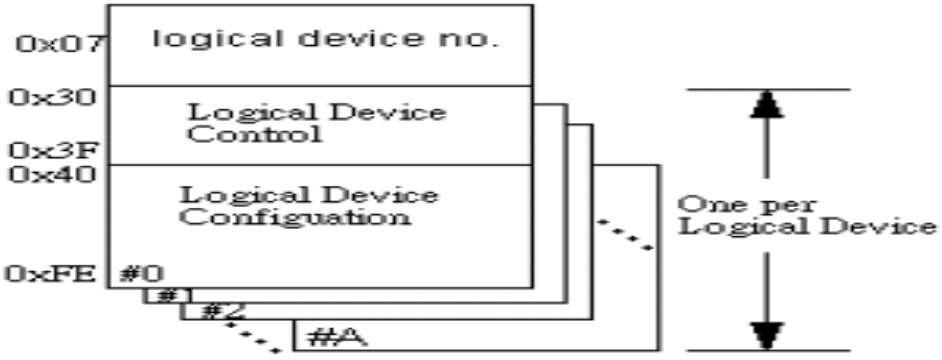
3.5 WDT Function

The algorithm of the WDT function can be simply described as a timer counting process with an output event. The Time-Out period (Twd) can be set by software commands or hardware jumpers that depend on the board circuit design and may be different among the boards. This timer can be used to monitor a software hang.

WADE-8067 allows users to control WDT by issuing dynamic software commands. The WDT starts counting when it is activated. It will cause a system reset once it expires. Before WDT expires, a refreshing command with a Twd can be issued to re-count WDT and continue the status monitoring. If the system encounters a software or application hang, WDT will generate a system reset after its timeout.

The related Control Registers of WDT are included in the following programming guide that is written in C language. User can write a non-zero value (defined as Twd) into the Time-out Value Register (CR_Twd) to enable WDT. Users can write 0x00 and then Twd to CR_Twd to refresh WDT. To refresh WDT, the time tolerance of refreshing interval must be considered. The smaller of Twd, the more deviation of WDT and you need to include more tolerance. "Let Twd be longer than 2 seconds" is the recommendation due to the limitation of Winbond W83627THG WDT. You can call Portwell support center for reference. The value read back from CR_Twd indicates the counting down value instead of the original Twd. System will be reset after the Time-out Value to be counted down to zero. Users can directly fill a zero value into CR_Twd to disable WDT immediately. To ensure a successful access to the desired Control Register, the following programming guide should be followed.

Programming guide:
CR: Configuration Register.
LD: Logical Device of SIO. There are 11 LDs in W83627THG SIO.
CR00~2F: Global Control Registers. (All LDs share these CRs)
CR07: LD selection.
CR30~FF: Each LD has its own CR30~FF.



There are two I/O ports as I/O access window for configuring WDT,

1) IO port 0x2E is H/W strapped and named as EFIR (Extended Function Index Register, for identifying CR index number)
2) IO port 0x2F is H/W strapped and named as EFDR (Extended Function Data Register, for accessing desired CR)

<< How to access W83627THG Configuration Register >>

First, it needs to enter extended function mode.

Enter extended function mode for accessing W83627THG configuration registers:

```
outportb(EFIR, 0x87);
outportb(EFIR, 0x87);  // double IO write
```

Read Configuration Register CR_rx, and keep this byte to unsigned char al_char

```
outportb(EFIR, CR_rx ) ;
al_char = inportb(EFDR) ;
```

Write Configuration Register CR_wx with byte al_char1 ;

```
outportb(EFIR, CR_wx ) ;
outportb(EFDR, al_char1);
```

Exit extended mode after completion of configuration register access.

```
outportb(EFIR, 0xaa);
```

<< How to access W83627THG WDT Configuration Register >>

Must enter extended function mode first, then follow the following steps for accessing WDT registers.

Step(1) : CR2B_bit[3,2]P[0,1]

```
Initialize the multiplex pin ( pin89 ) to WDTO function
outportb ( EFIR , 0x2B ) ;                  // al_char1 : unsigned char
al_char1 = inportb ( EFDR ) & 0xF7 ;  // CR2B_bit3, bit2 P01
outportb ( EFIR , 0x2B ) ;                  // init pin 89 to WDT
outportb ( EFDR , al_char1 ) ;
```

Step(2) : CR07_P08

```
Ponit to LD8.
outportb ( EFIR , 0x07 ) ;
outportb ( EFDR , 0x08 ) ;
```

Step(3) : LD8_CR30_bit0P1

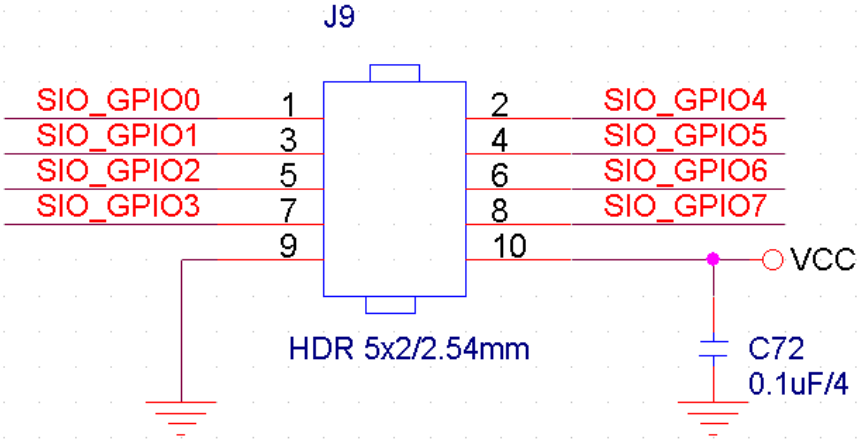
```
Activate LD8
outportb ( EFIR , 0x30 ) ;
al_char1 = inportb ( EFDR ) | 0x01 ;  // CR30_bit0P1
outportb ( EFIR , 0x30 ) ;                  // Activate LD8
outportb ( EFDR , al_char1 ) ;
```

Step(4) : LD8_CRF7_bit[7,6]P[0,0]
Not allow K/B and Mouse's interrupts to reload WDT timer.
outportb (EFIR , 0xF7) ;
al_char1 = inportb (EFDR) & 0x3F ; // CRF7_bit[7,6]P[0,0]
outportb (EFIR , 0xF7) ;
outportb (EFDR , al_char1) ;

Step(5) : Refresh WDT before it expires.
Once WDT expires , system will be reset.
LD8_CRF5_bit3 : 0 : second unit
1 : minute unit
LD8_CRF6 : T_{wd} , "Writing 00" means "disable WDT"
1~255 time unit(time unit : second, minute)

Notes:
"CR2B_bit3, bit2 P01" means "Write 0,1 to bit3, bit2 of Configuration Register 0x2B".

3.6 GPIO



J9 : General Purpose Input/Output Interface Connector

There are 8 bi-directional GPIO pins on WADE-8067. SIO_**GPIO0, SIO_GPIO1, SIO_GPIO2 …..SIO_GPIO7 are dedicated GPIO pins with 100mA current sink capacity at 5V signal level.**
Refer to the W83627THG data sheet to configure both input / output port , SGP10~17, by programming W83627THG GPIO registers. To read/write these 8 GPIO pins is simply to read /write W83627THG SGP10~17 data register, and W83627THG SGP10~17 pins.

3.6.1 Pin assignment

J9 : General Purpose I/O Connector

PIN No.	Signal Description
1	General Purpose IO port 0
2	General Purpose IO port 4
3	General Purpose IO port 1
4	General Purpose IO port 5
5	General Purpose IO port 2
6	General Purpose IO port 6
7	General Purpose IO port 3
8	General Purpose IO port 7
9	Ground
10	+5V

3.6.2 Programming Guide:

Must enter extended function mode (Double I/O write 0x87 to EFIR) first, then follow the following steps for accessing GPIO pins. When completion of GPIO access, Exit extended mode (I/O write 0xaa to EFIR).

(1) Initialize W83627THG multiplex pins to SGP10~17 function
```
CR29_bit[7:6]P[0,1]
outportb ( EFIR , 0x29 ) ;                  // al_char1 : unsigned char
al_char1 = inportb ( EFDR ) & 0x7F ;  // CR29_bit[7:6]P[0,1]
outportb ( EFIR , 0x29 ) ;                  // init SGP10~17 function
outportb ( EFDR , al_char1 ) ;
```

(2) Point to LD7 (for SGP10~17 GPIO port registers) and activate its function
```
CR07_P07   ;  Point to LD7
outportb ( EFIR , 0x07 ) ;
outportb ( EFDR , 0x07 ) ;
outportb ( EFIR , 0x30 ) ;
al_char1 = inportb ( EFDR ) & 0x01 ;  // CR30_bit0P1
outportb ( EFIR , 0x30 ) ;                  // Activate LD7
outportb ( EFDR , al_char1 ) ;
```

(3) LD7_CRF0_PFF or LD7_CRF0_P00
```
outportb ( EFIR , 0xF0 ) ;
outportb ( EFDR , 0xFF ) ;              //SIO_GPIO[7..0] are programmed as input
outportb ( EFDR , 0x00 ) ;              //SIO_GPIO[7..0] are programmed as output
                                ; 0 for output and 1 for input for each bit
```

(4) LD7_CRF2_P00 or LD7_CRF2_P00 ;
1 for Inverse input/output signals, 0 for none inverse input/output signals
outportb (EFIR , 0xF2) ;
outportb (EFDR , 0xFF) ;
outportb (EFDR , 0x00) ;

(5) LD7_CRF1 ; Data Register for reading/writing data to GPIO pins

Chapter 4
BIOS Setup Information

WADE-8067 is equipped with the AMI BIOS stored in Flash ROM. These BIOS has a built-in Setup program that allows users to modify the basic system configuration easily. This type of information is stored in CMOS RAM so that it is retained during power-off periods. When system is turned on, WADE-8067 communicates with peripheral devices and checks its hardware resources against the configuration information stored in the CMOS memory. If any error is detected, or the CMOS parameters need to be initially defined, the diagnostic program will prompt the user to enter the SETUP program. Some errors are significant enough to abort the start up.

4.1 Entering Setup -- Launch System Setup

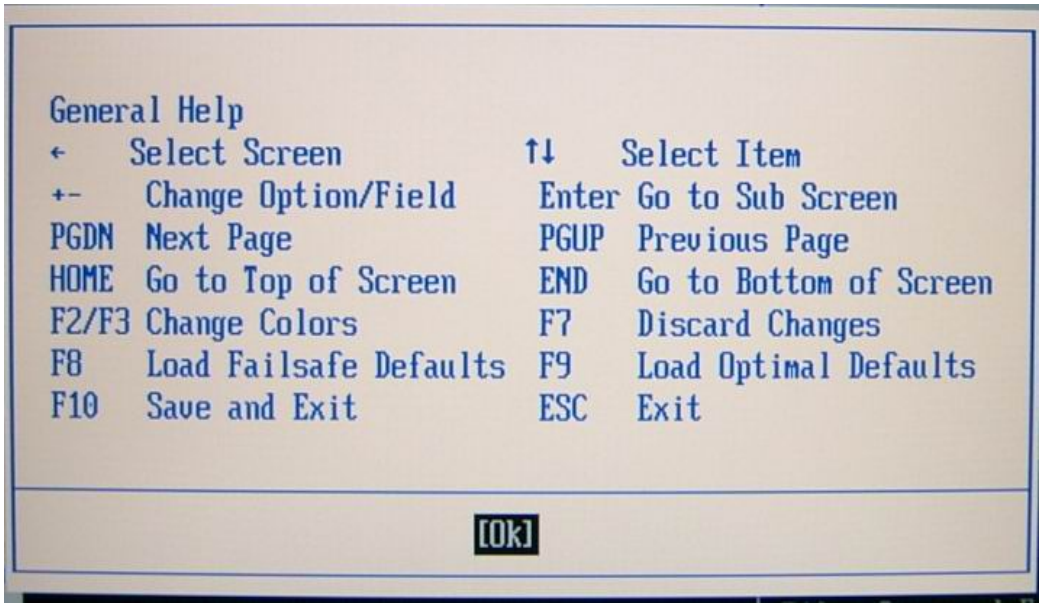
Power on the computer and the system will start POST (Power On Self Test) process. When the message below appears on the screen, press <Del> key to enter Setup.

Press <Del> to enter SETUP

If the message disappears before you respond and you still wish to enter Setup, restart the system by turning it OFF and On or pressing the RESET button. You may also restart the system by simultaneously pressing <Ctrl>, <Alt>, and <Delete> keys.

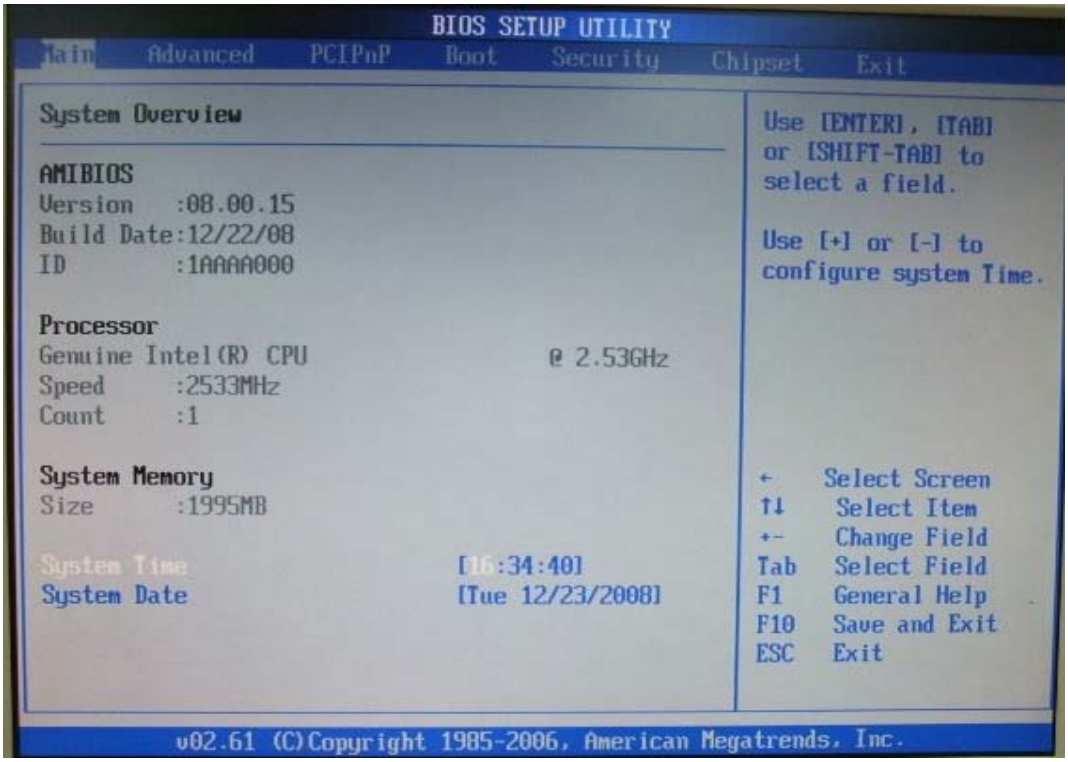
Press <F1> to Run SETUP or Resume

The BIOS setup program provides a General Help screen. You can call up this screen from any menu by simply pressing <F1>. The Help screen lists the appropriate keys to use and the possible selections for the highlighted item. Press <Esc> to exit the Help screen.



4.2 Main

Use this menu for basic system configurations, such as time, date etc.



AMI BIOS, Processor, System Memory

These items show the firmware and hardware specifications of your system. Read only.

System Time

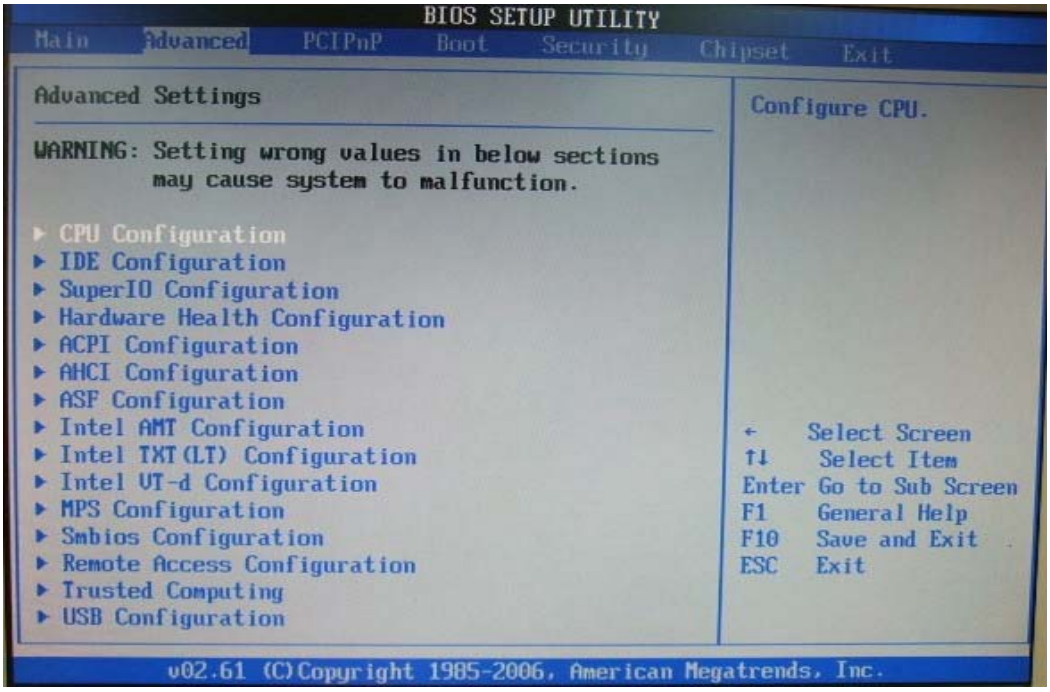
The time format is <Hour> <Minute> <Second>. Use [+] or [−] to configure system Time.

System Date

The date format is <Day>, <Month> <Date> <Year>. Use [+] or [−] to configure system Date.

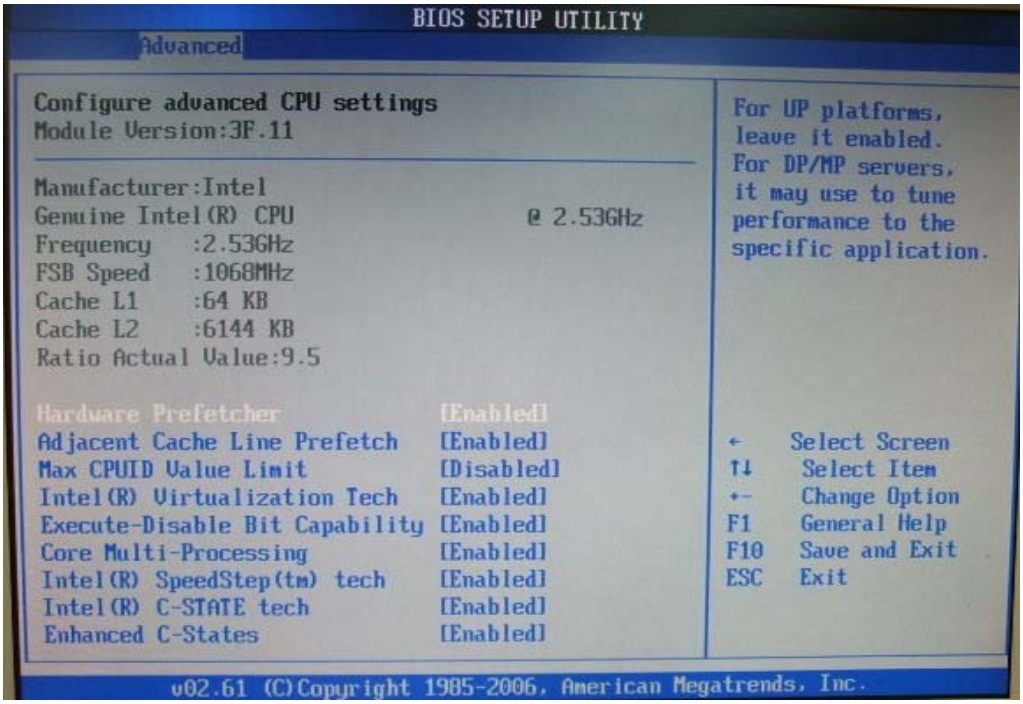
4.3 Advanced

Use this menu to set up the items of special enhanced features.



CPU Configuration

These items show the advanced specifications of your CPU. Read only.



Hardware Prefetcher

For UP platforms, leave it enabled. For DP/MP servers, it may use to tune performance the specific application.

The choice: Disabled, Enabled.

Adjacent Cache Line Prefetch

For UP platforms, leave it enabled. For DP/MP servers, it may use to tune performance the specific application.

The choice: Disabled, Enabled.

Max CPUID Value Limit

Disabled for Windows XP

The choice: Disabled, Enabled.

Intel(R) Virtualization Tech

A VMM can utilize the additional HW Caps, provided by Intel(R) Virtualization Tech.

Note: A full reset is required to change the setting.
The choice: Disabled, Enabled.

Execute-Disable Bit capability

When disabled, force the XD feature flag to always return 0

The choice: Disabled, Enabled.

Core Multi-Processing

Disabled disable one execution core of each CPU die.

The choice: Disabled, Enabled.

Intel(R) Speed Step (tm) Tech

Disable: Disable GV3.
Enable: Enable GV3.

Intel(R) C-STATE Tech

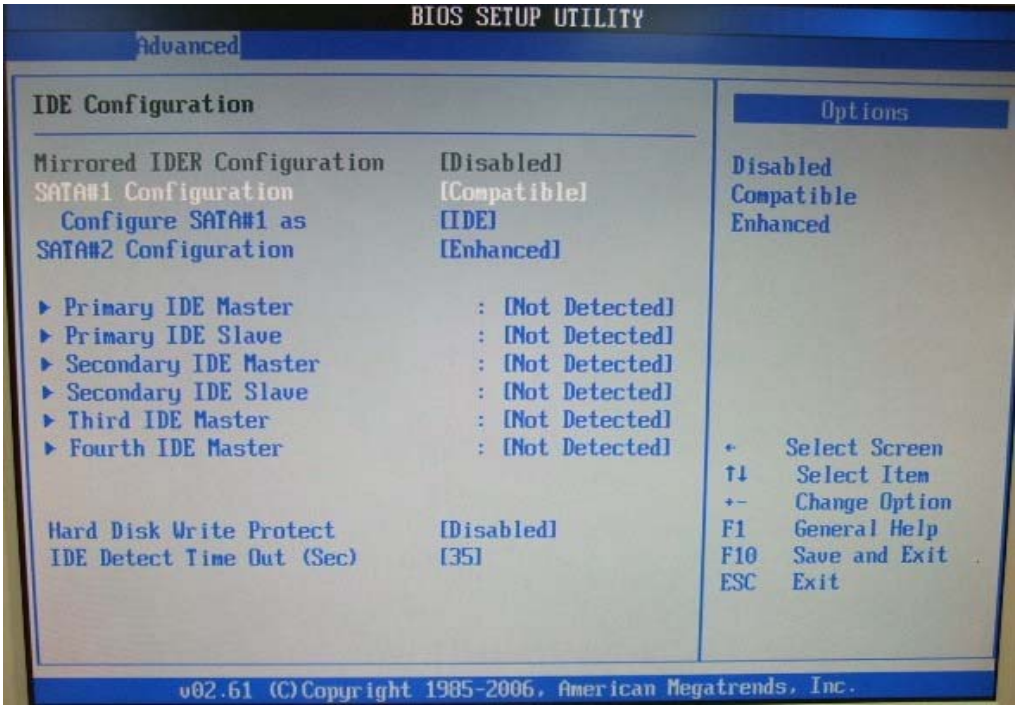
CPU idle is set to C2, C3, C4 State.

Enhanced C-States

CPU idle is set to Enhanced C-States.

IDE Configuration

The IDE Configuration the IDE devices, such as hard disk drive or CD-ROM drive. It uses a separate sub menu to configure each hard disk drive (Master and Slave).



Mirrored IDER Configuration

The choice: Disabled, Enabled.

SATA#1 Configuration

The choice: Disabled, Compatible, Enabled.

Configure SATA#1 as

This setting specifies the function of the on-chip SATA#1 controller.

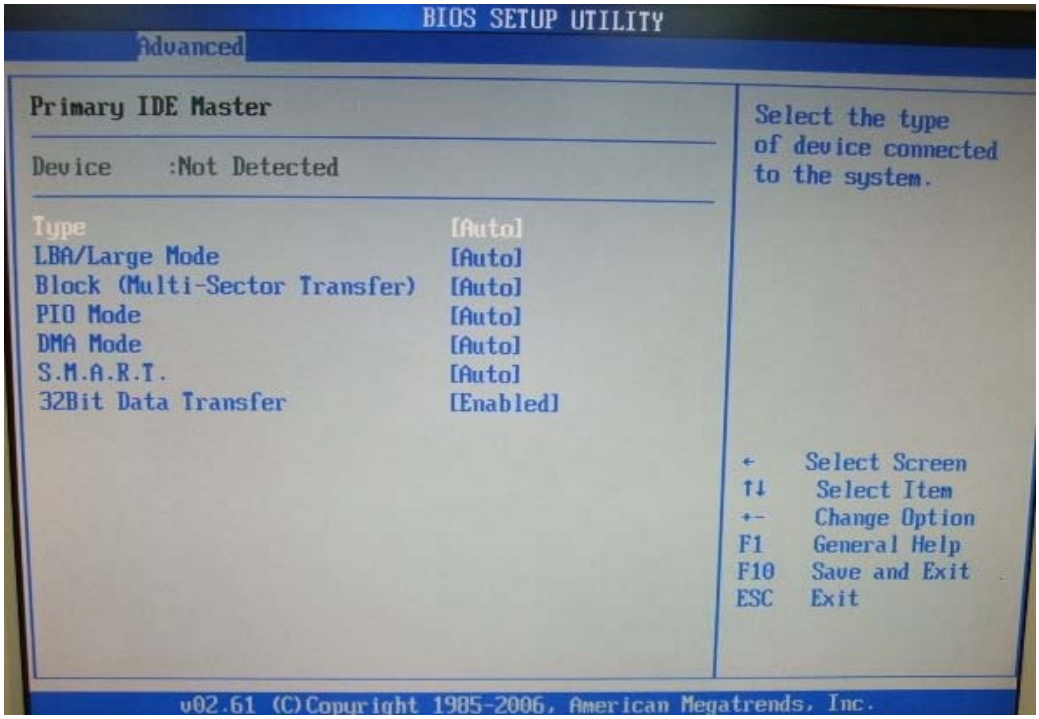
The choice: IDE, RAID, AHCI.

SATA#2 Configuration

The choice: Disabled, Enabled.

Primary / Secondary / Third / Fourth IDE Master / Slave

While entering setup, BIOS auto detects the presence of IDE devices. This displays the status of auto detection of IDE devices.



[Type] Press PgUp/<+> or PgDn/<—> to select [Manual], [None] or [Auto] type. You can use [Manual] to define your own drive type manually.

[LBA/Large Mode] Enabling LBA causes Logical Block Addressing to be used in place of Cylinders, Heads and Sectors.

[Block (Multi-Sector Transfer)] Any selection except Disabled determines the number of sectors transferred per block.

[PIO Mode] Indicates the type of PIO (Programmed Input/Output)

[DMA Mode] Indicates the type of Ultra DMA

[S.M.A.R.T.] This allows you to activate the S.M.A.R.T. (Self-Monitoring Analysis & Reporting Technology) capability for the hard disks. S. M.A.R.T is a utility that monitors your disk status to predict hard disk failure. This gives you an opportunity to move data from a hard disk that is going to fail to a safe place before the hard disk becomes offline.

[32 Bit Data Transfer] Enable/Disable 32-bit Data Transfer.

Hard Disk Write Protect

Disabled/Enabled device write protection, this will be effective only if device is accessed through BIOS.

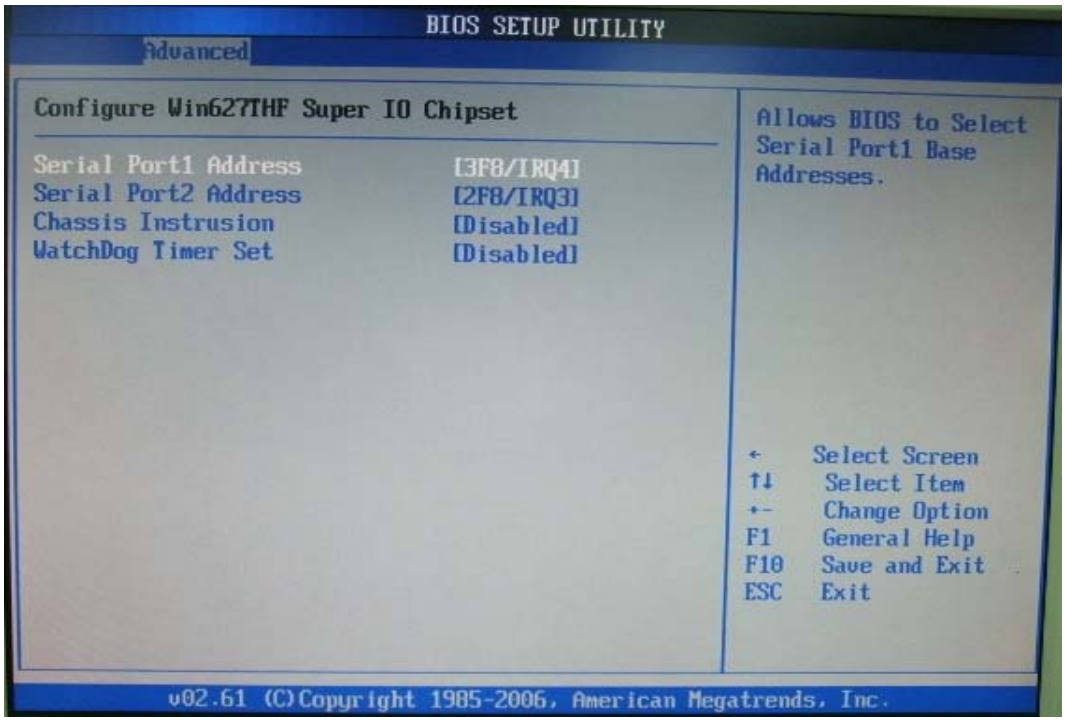
The choice: Disabled, Enabled.

IDE Detect Time Out (Sec)

Select the time out value for detecting ATA/ATAPI device (s).

The choice: 0, 5, 10, 15, 20, 25, 30, 35.

Super IO Configuration



Serial Port 1 Address

Allows BIOS Select Serial Port1 Base Addresses.

The choice: Disabled, 3F8/IRQ4, 3E8/IRQ4, 2E8/IRQ3.

Serial Port 2 Address

Allows BIOS Select Serial Port2 Base Addresses.

The choice: Disabled, 2F8/IRQ3, 3E8/IRQ4, 2E8/IRQ3.

Chassis Instrusion

The choice: Disabled, Enabled.

Watch Dog Timer Set

This BIOS testing option is able to reset the system according to the selected table.

The choice: Disabled, 10, 20, 30, 40 sec. 1, 2, 4 min.

Hardware Health Configuration

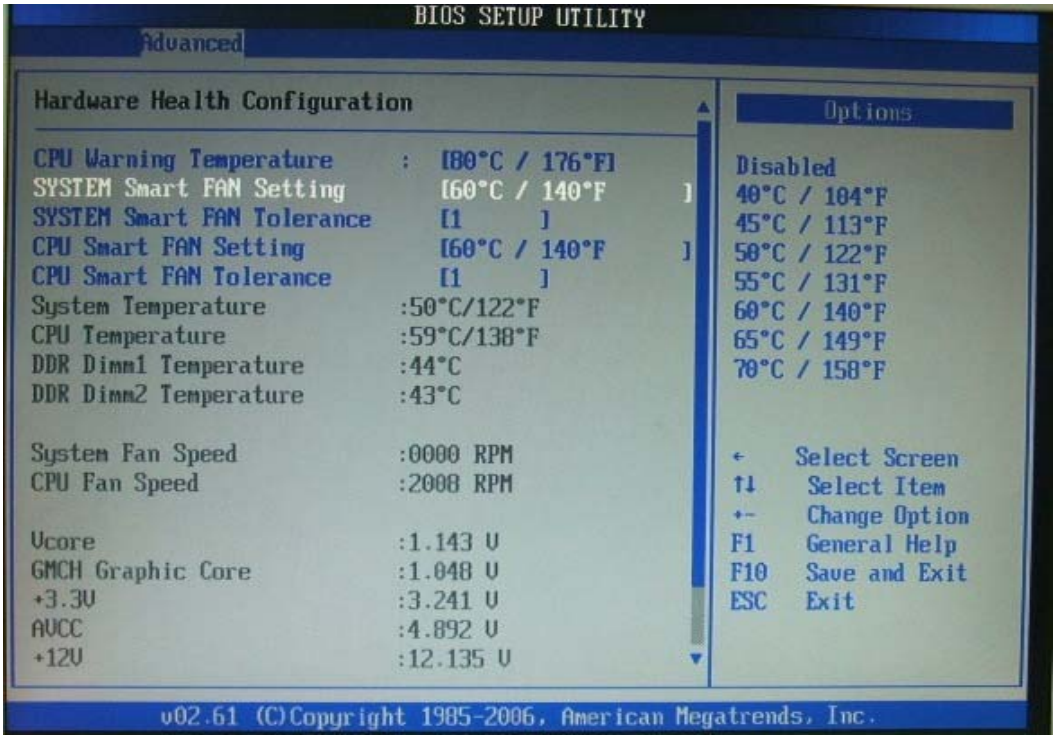
Configuration / monitor the Hardware Health.

CPU Warning Temperature

The choice: Disabled, 50℃/122℉, 60℃/140℉, 70℃/158℉, 75℃/167℉, 80℃/176℉, 85℃/185℉, 90℃/194℉, 95℃/205℉.

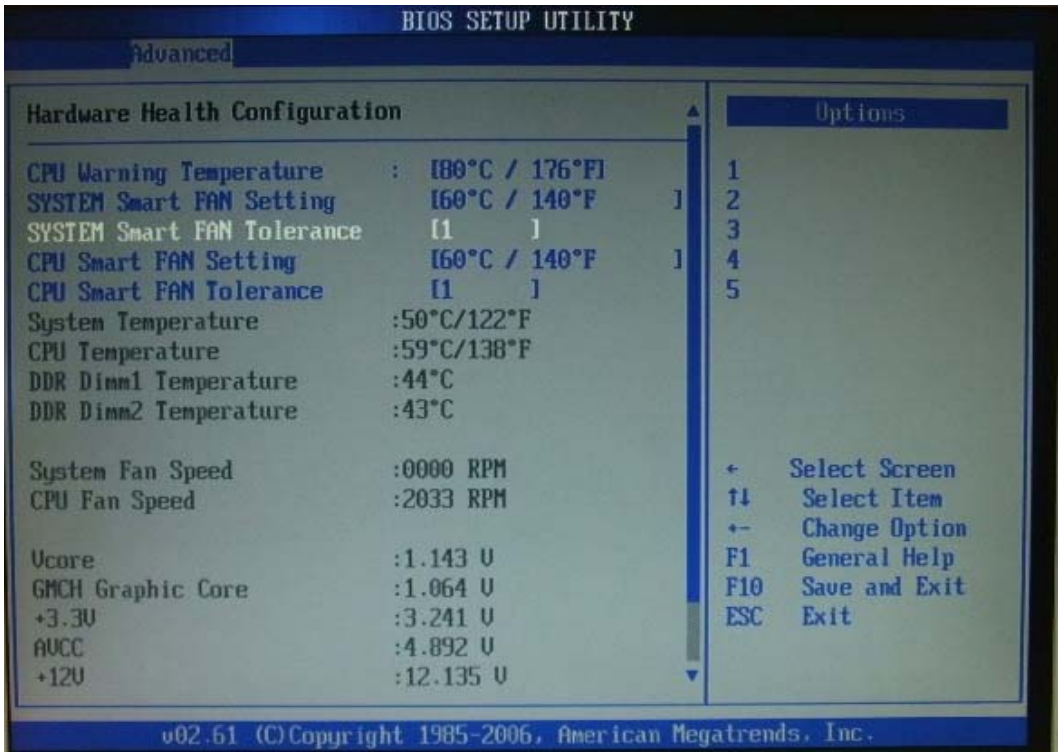
SYSTEM Smart FAN Setting

The choice: Disabled, 40℃/104℉, 45℃/113℉, 50℃/122℉, 55℃/131℉, 60℃/140℉, 65℃/149℉, 70℃/158℉.



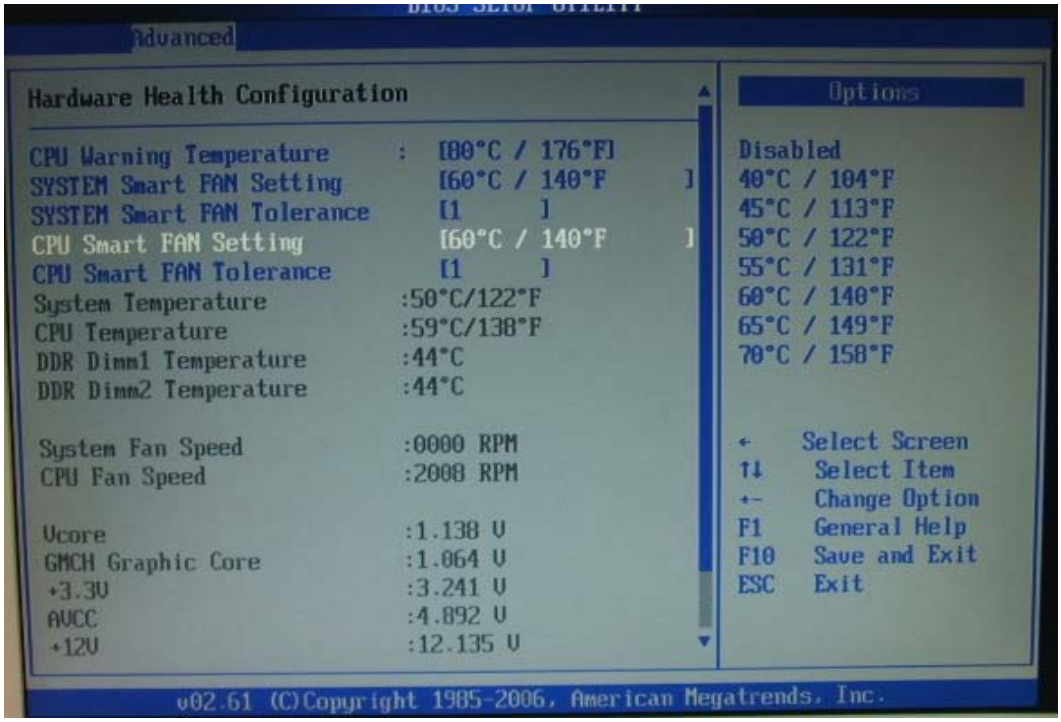
SYSTEM Smart FAN Tolerance

The choice: 1, 2, 3, 4, 5



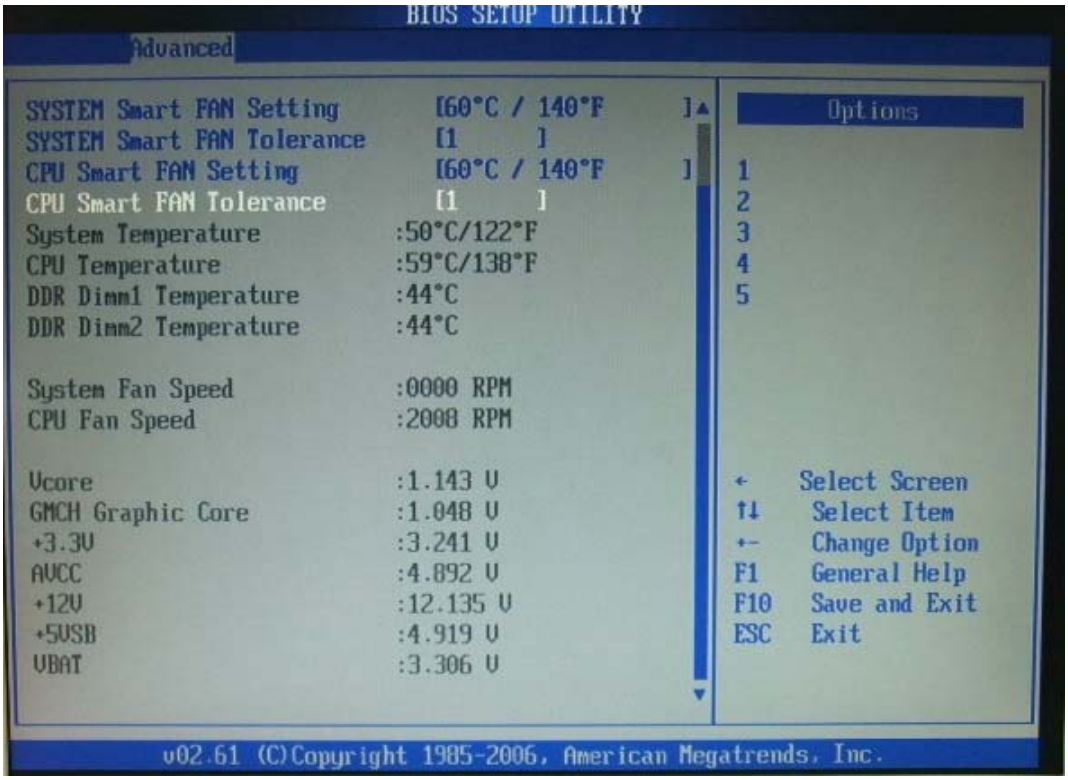
CPU Smart FAN Setting

The choice: Disabled, 40℃/104℉, 45℃/113℉, 50℃/122℉, 55℃/131℉, 60℃/140℉, 65℃/149℉, 70℃/158℉.



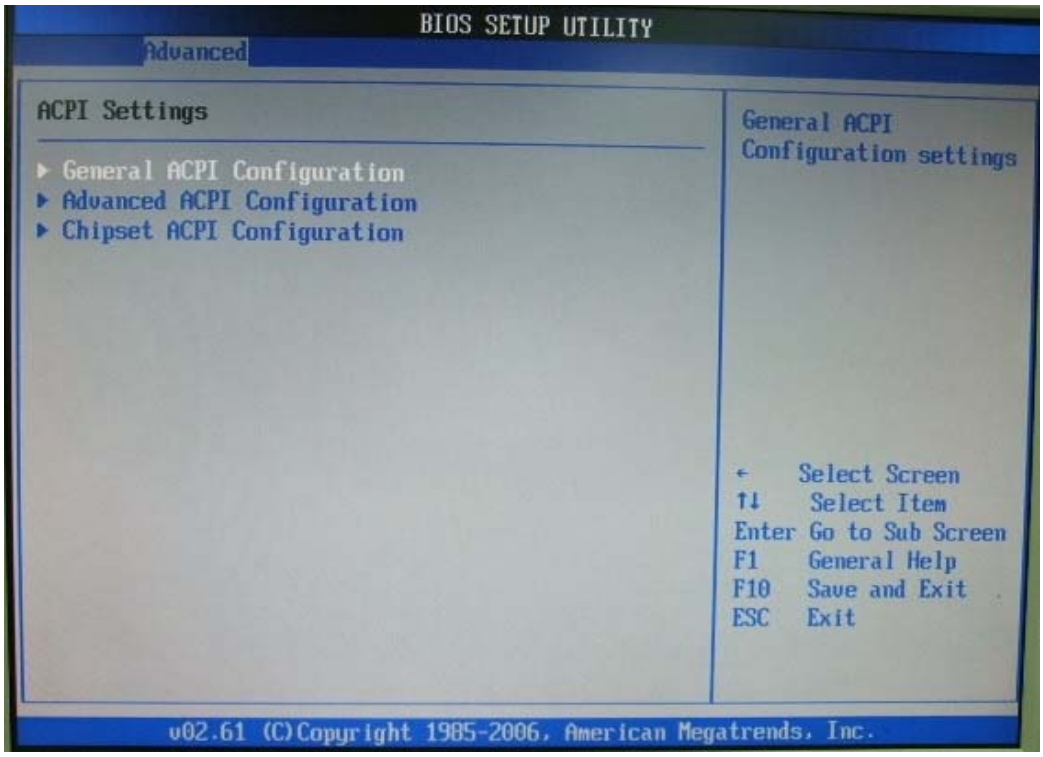
CPU Smart FAN Tolerance

The choice: 1, 2, 3, 4, 5

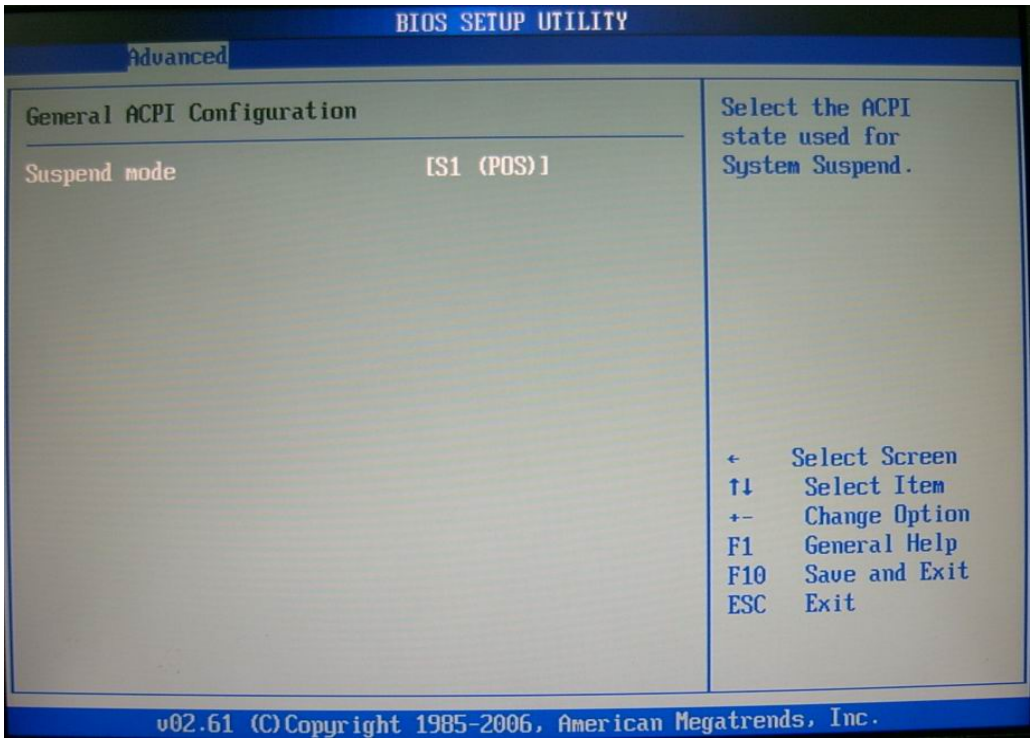


ACPI Settings

Select for Advanced ACPI Configuration.



General ACPI Configuration



Suspend mode

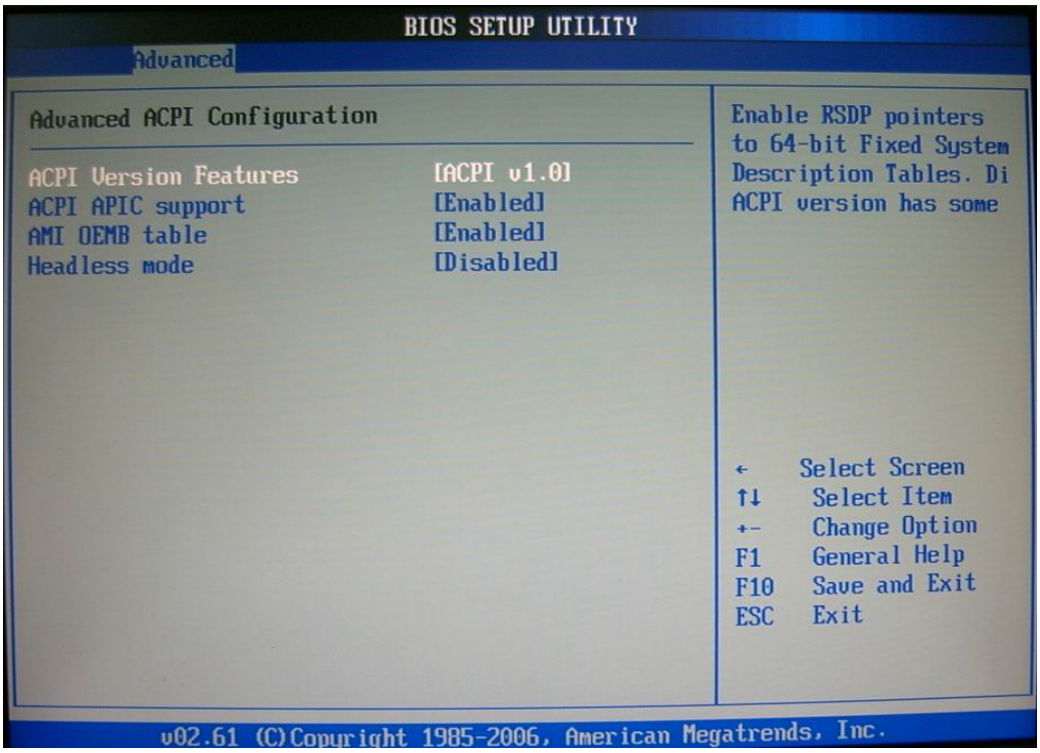
This item specifies the power saving modes for ACPI function. If your operating system supports ACPI, you can choose to enter the Standby mode in S1 (POS) or S3 (STR) fashion through the setting of this field. Options are:

[S1 (POS)] The S1 sleep mode is a low power state. In this state, no system context is lost (CPU or chipset) and hardware maintains all system contexts.

[S3 (STR)] The S3 sleep mode is a lower power state where the information of system configuration and open applications/ files is saved to main memory that remains powered while most other hardware components turn off to save energy. The information stored in memory will be used to restore the system when a “wake up” event occurs.

Advanced ACPI Configuration

Advanced ACPI Configuration settings, Use this section to configure additional ACPI options.


BIOS SETUP UTILITY
Advanced
Advanced ACPI Configuration
ACPI Version Features [ACPI v1.0]
ACPI APIC support [Enabled]
AMI OEMB table [Enabled]
Headless mode [Disabled]
Enable RSDP pointers to 64-bit Fixed System Description Tables. Di ACPI version has some
← Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F10 Save and Exit
ESC Exit
v02.61 (C)Copyright 1985-2006, American Megatrends, Inc.

ACPI Version Features

Enable RSDP pointers to 64-bit Fixed System Description Tables.

The choice: ACPI v1.0 / ACPI v2.0 / ACPI v3.0.

ACPI APIC support

Include ACPI APIC table pointer to RSDT pointer list.

The choice: Disabled, Enabled.

AMI OEMB table

Include OEMB table pointer to R(X) SDT pointer list.

The choice: Disabled, Enabled.

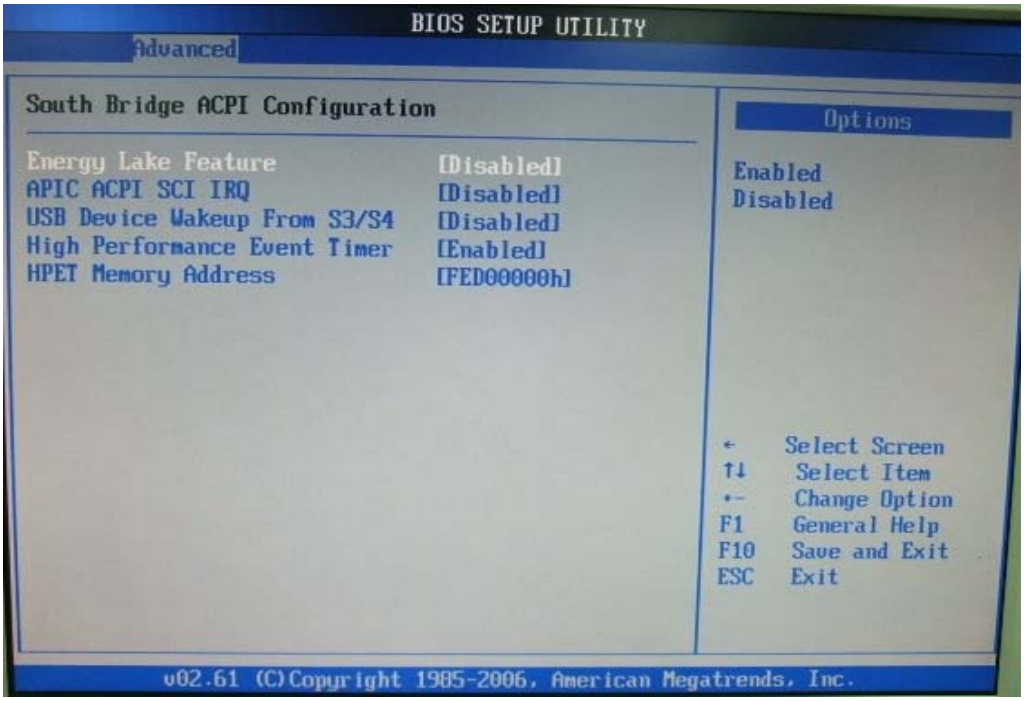
Headless mode

Enable / Disable Headless operation mode through ACPI.

The choice: Disabled, Enabled.

South Bridge ACPI Configuration

The South Bridge ACPI related Configuration settings, Use this section to configure additional ACPI options.



Energy Lake Feature

Select the ACPI state used for System Suspend.

The choice: Disabled, Enabled.

APIC ACPI SCI IRQ

Enable / Disable APIC ACPI SCI IRQ.

The choice: Disabled, Enabled.

USB Device Wake From S3/S4

Enable / Disable USB device Wake from S3/S4 mode.

The choice: Disabled, Enabled.

High Performance Event Time

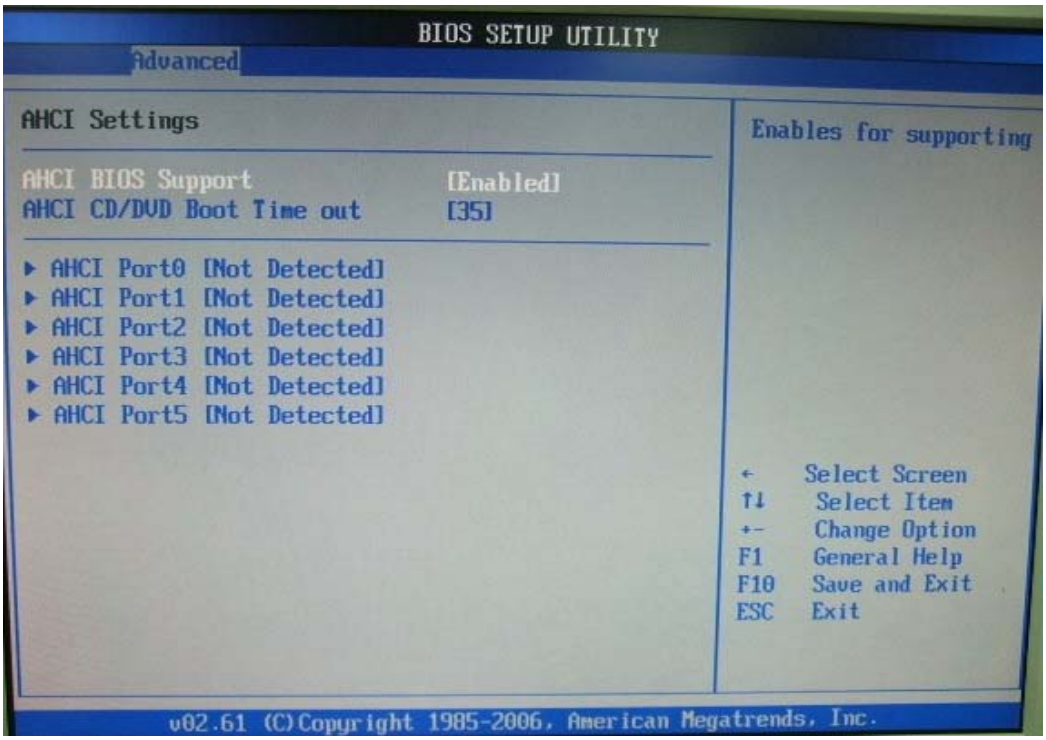
The choice: Disabled, Enabled.

HPET Memory Address

The choice: FED0000h, FED1000h, FED2000h, FED3000h

AHCI Settings

Select for AHCI Configuration.



AHCI BIOS Support

Enables for supporting

The choice: Disabled, Enabled.

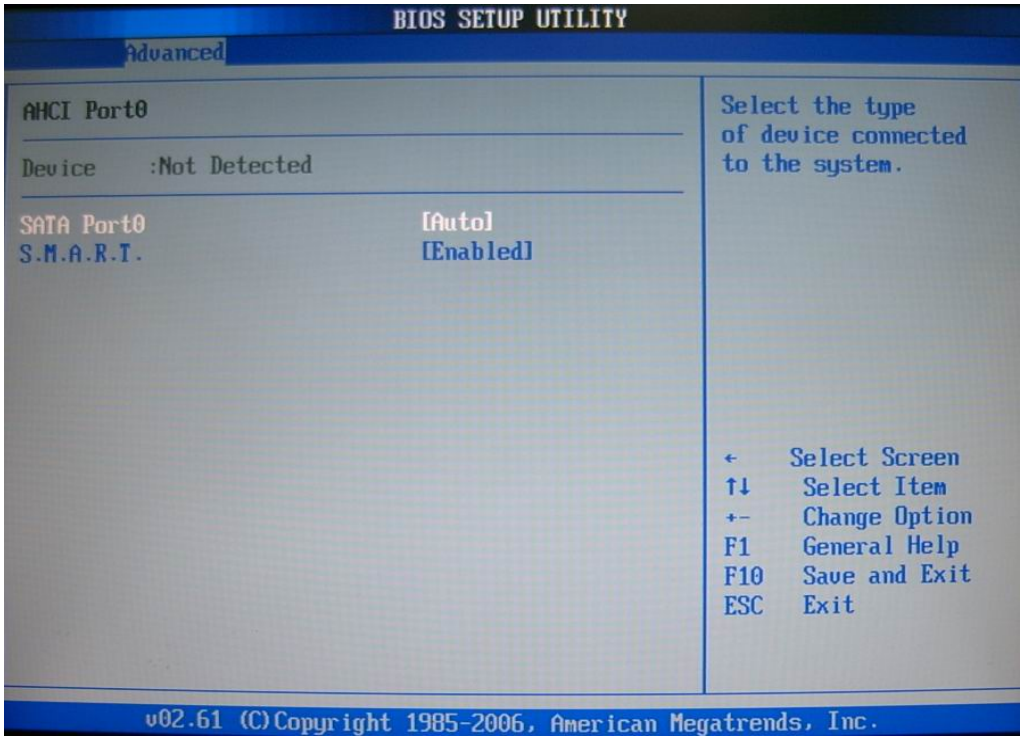
AHCI CD/DVD Boot Time out

Some SATA CD/DVD in AHCI mode need to wait ready longer.

The choice: 0, 5, 10, 15, 20, 25, 30, 35.

AHCI Port0 ~ Port5

While entering setup, BIOS auto detects the presence of IDE devices. This displays the status of auto detection of IDE devices.



SATA Port0 ~ Port5

Select the type of device connected to the system.

The choice: Auto, Not Installed.

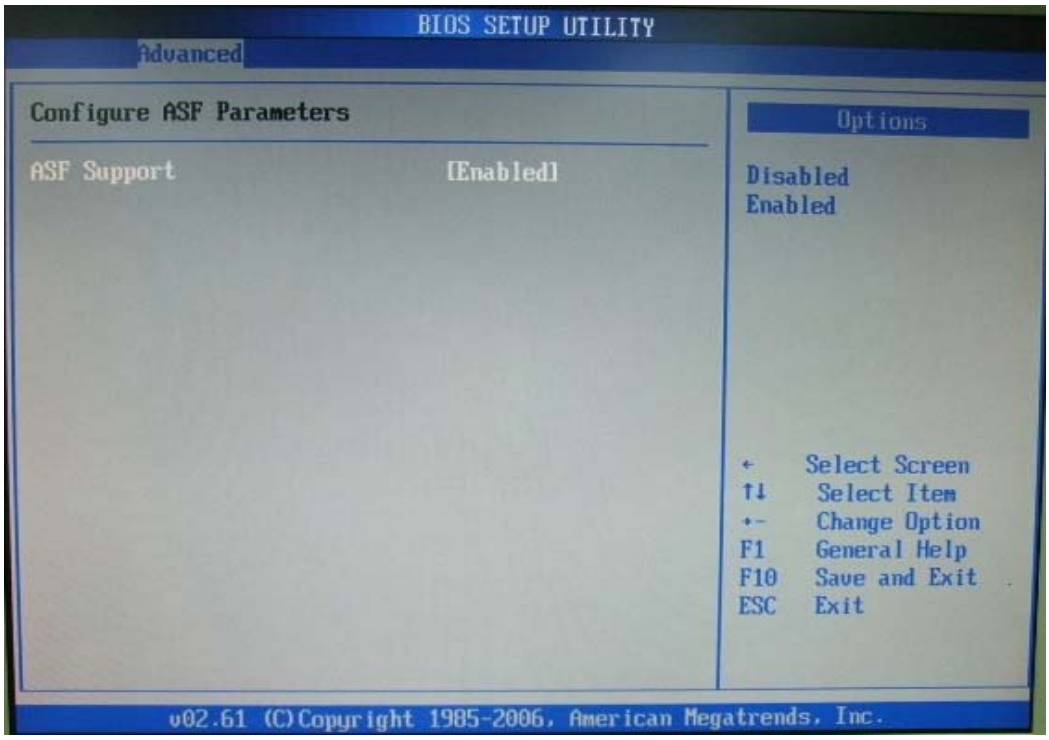
S.M.A.R.T

This allows you to activate the S.M.A.R.T. (Self-Monitoring Analysis & Reporting Technology) capability for the hard disks. S. M.A.R.T is a utility that monitors your disk status to predict hard disk failure. This gives you an opportunity to move data from a hard disk that is going to fail to a safe place before the hard disk becomes offline.

The choice: Disabled, Enabled.

Configure ASF Parameters

Select for ASF Support

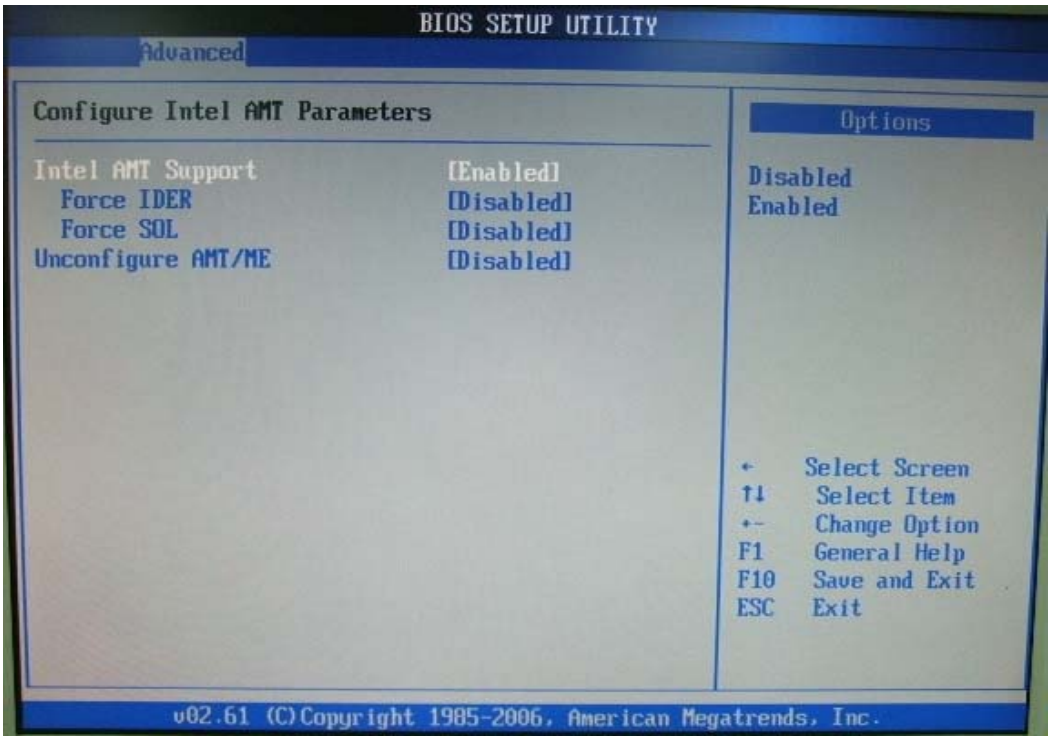


ASF Support

The choice: Disabled, Enabled.

Configure Intel AMT Parameters

Select for Intel AMT Configuration.



Intel AMT Support

The choice: Disabled, Enabled.

Force IDER

The choice: Disabled, IDER Pri. Master, IDER Pri. Slave, IDER Sec. Master, IDER Sec. Slave

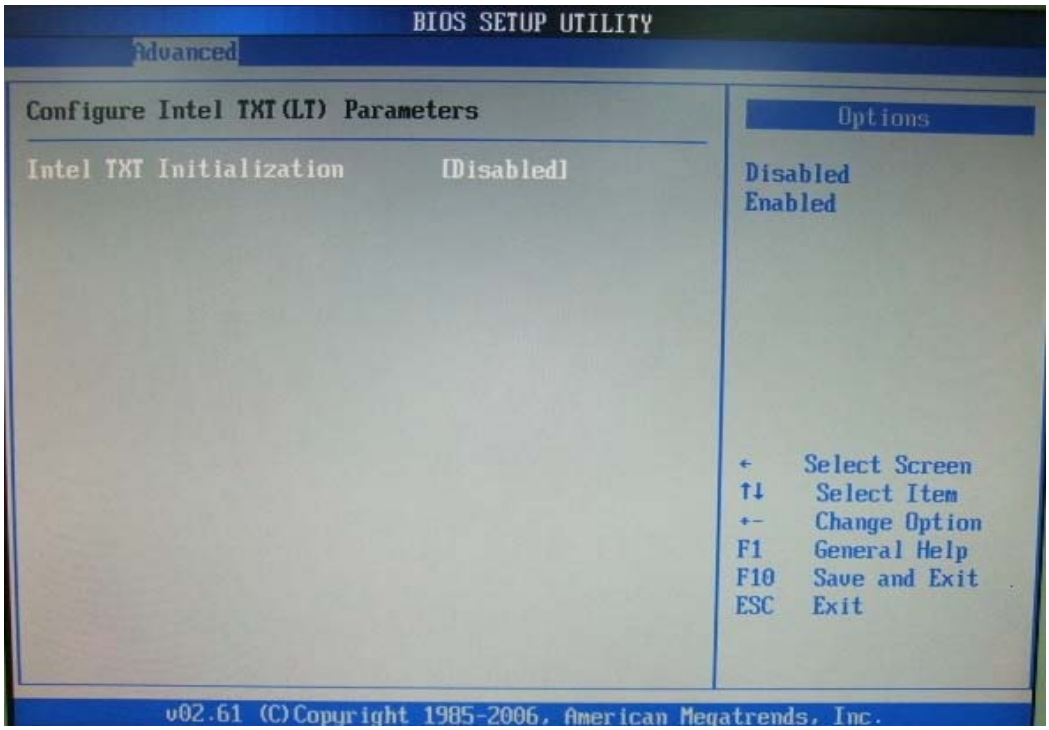
Force SOL

The choice: Disabled, Enabled.

Unconfigure AMT/ME

The choice: Disabled, Enabled.

Configure Intel TXT (LT) Parameters



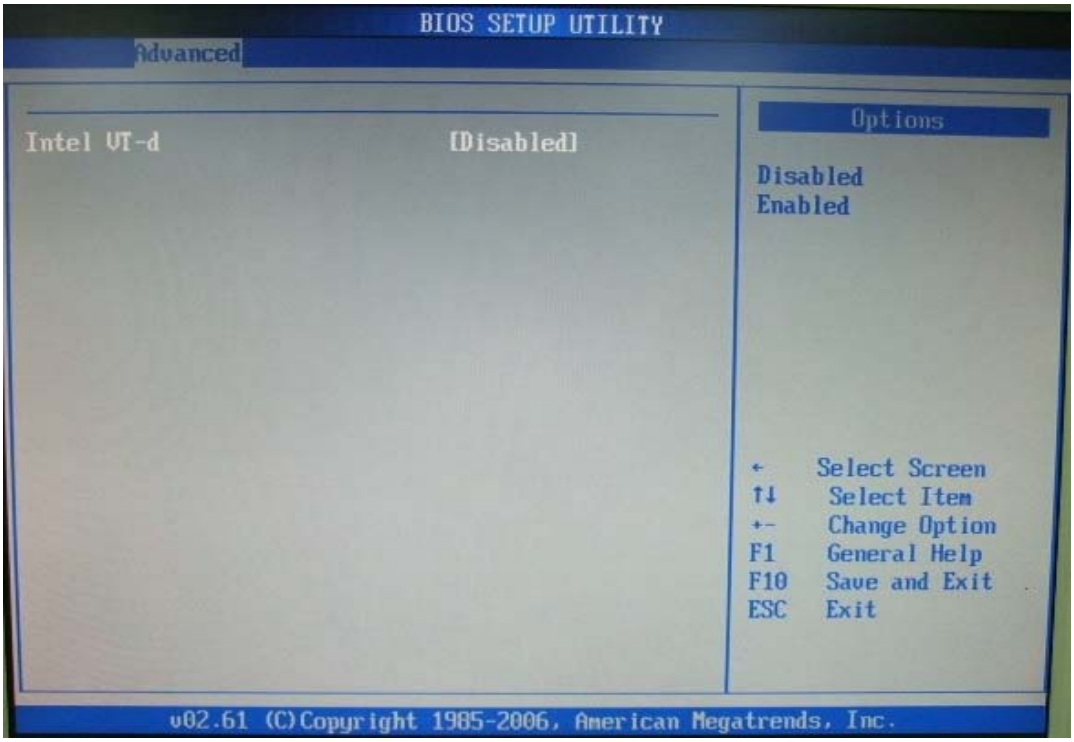
Intel TXT Initialization

The choice: Disabled, Enabled.

Intel VT-d

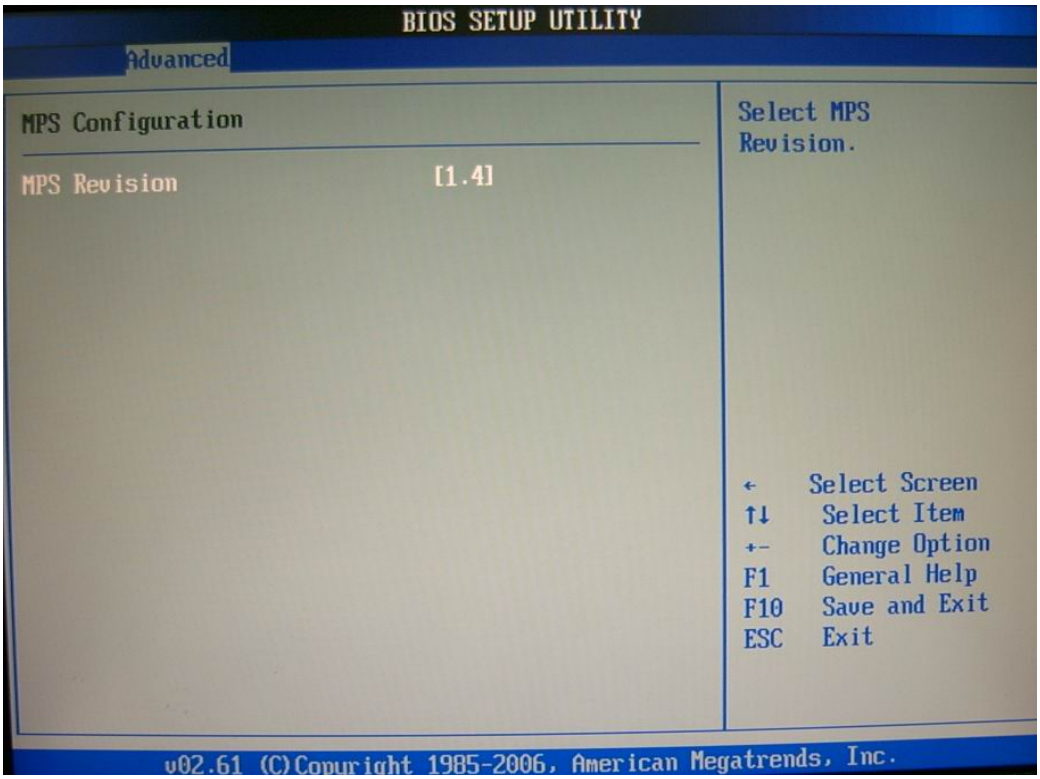
Select for Intel VT-d function.

The choice: Disabled, Enabled.



MPS Configuration

Configure the Multi-Processor Table.



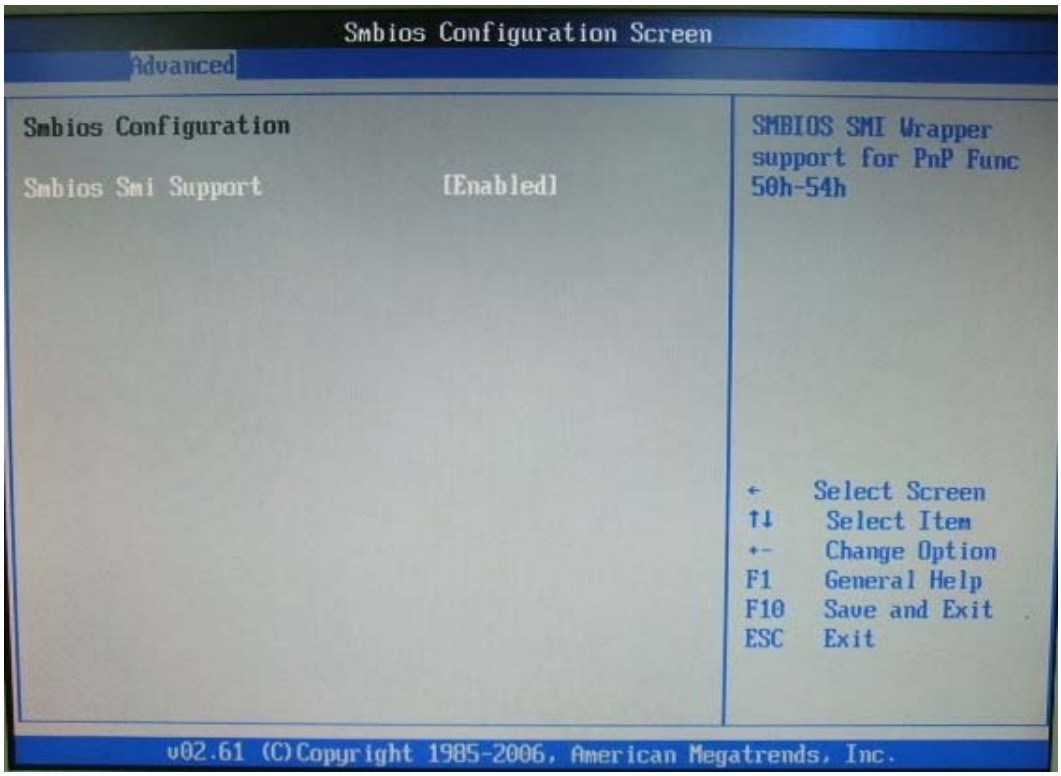
MPS Revision

This field allows you to select which MPS (Multi-Processor Specification) version to be used for the operating system. You need to select the MPS version supported by your operating system. To find out which version to use, consult the vendor of your operating system.

The choice: 1.1, 1.4.

Smbios Configuration

SMBIOS Configuration Menu

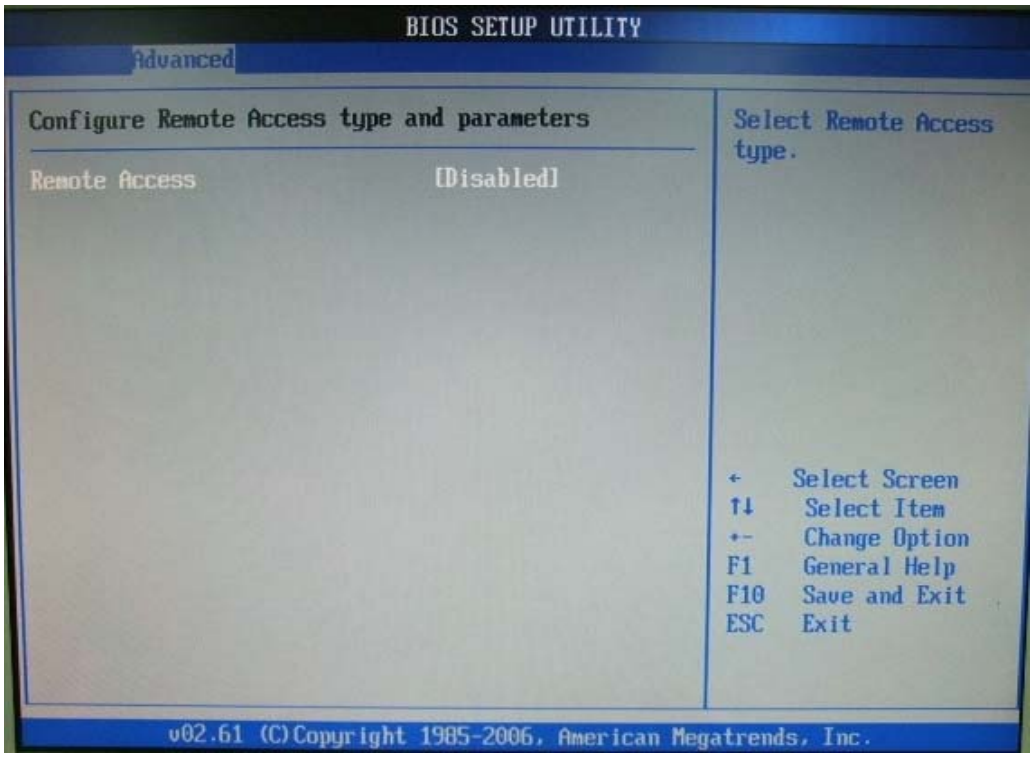


Smbios Smi Support

SMBIOS SMI Wrapper support for PnP Function 50h-54h

The choice: Disabled, Enabled.

Configure Remote Access type and parameters

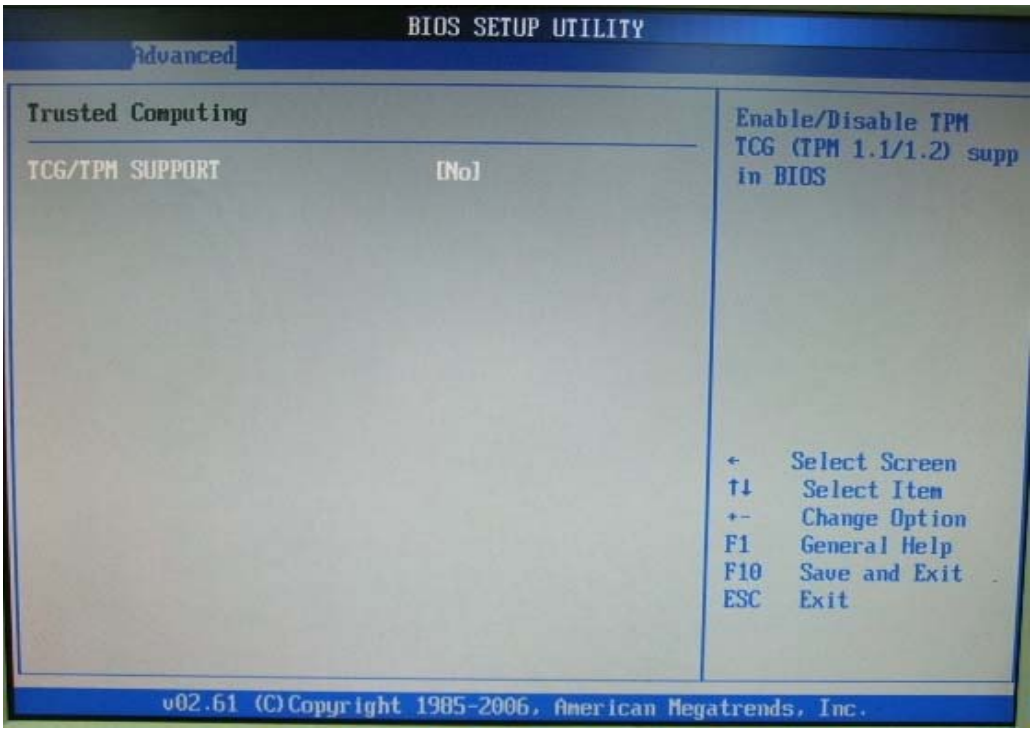


Remote Access

Select Remote Access type.

The choice: Disabled, Enabled.

Trusted Computing

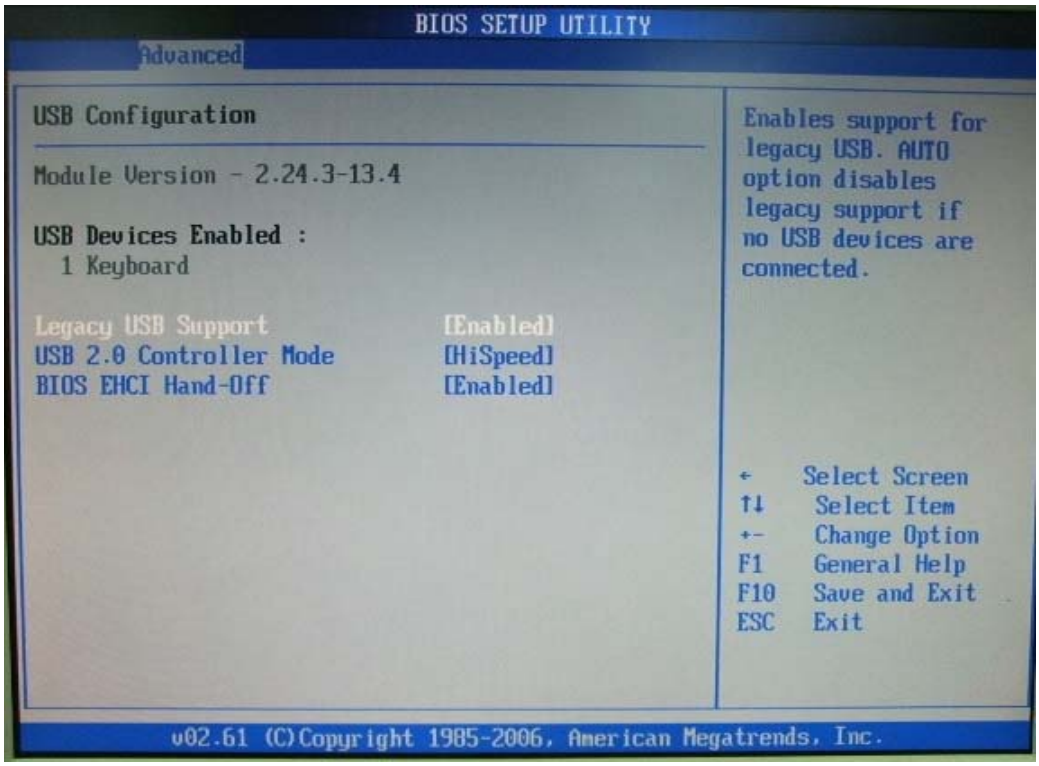


TCG/TPM SUPPORT

Enable/Disable TPM TCG (TPM 1.1/1.2) support in BIOS

The choice: No, Yes.

USB Configuration


BIOS SETUP UTILITY
Advanced
USB Configuration
Module Version - 2.24.3-13.4
USB Devices Enabled :
1 Keyboard
Legacy USB Support [Enabled]
USB 2.0 Controller Mode [HiSpeed]
BIOS EHCI Hand-Off [Enabled]
Enables support for legacy USB. AUTO option disables legacy support if no USB devices are connected.
← Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F10 Save and Exit
ESC Exit
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Legacy USB Support

Set to [Enabled] if you need to use any USB 1.1/2.0 device in the operating system that does not support or have any USB 1.1/2.0 driver installed, such as DOS and SCO Unix.

The choice: Disabled, Enabled, Auto.

USB 2.0 Controller Mode

This setting specifies the operation mode of the onboard USB 2.0 controller.

The choice: FullSpeed, HiSpeed.

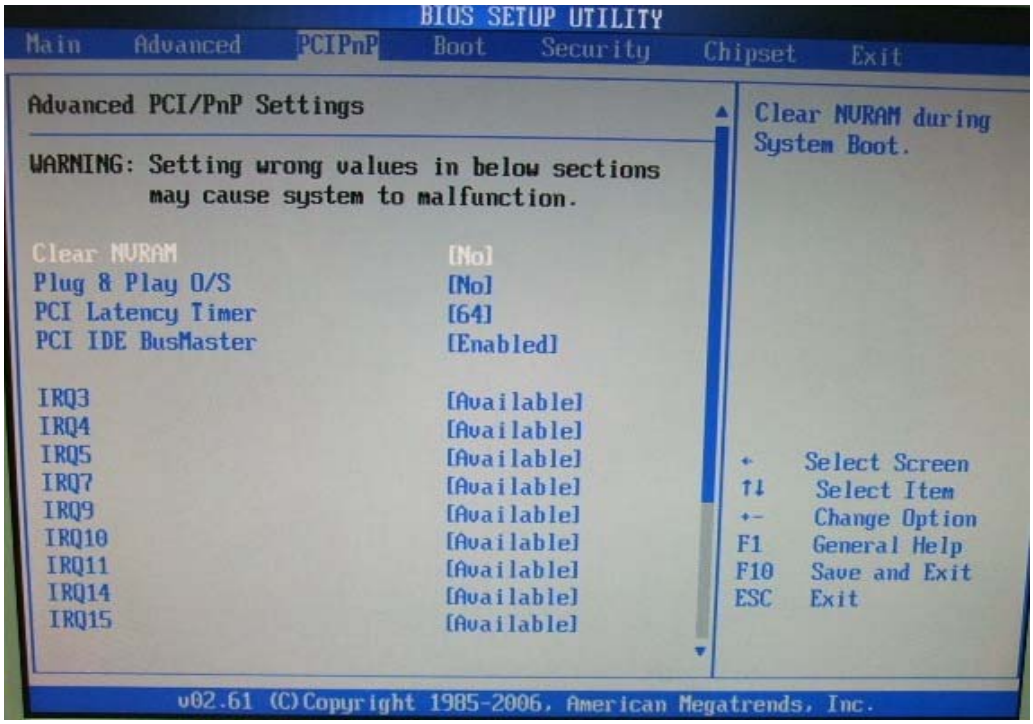
BIOS EHCI Hand-Off

This is a workaround for OSes without EHCI hand-off support. The EHCI ownership change should claim by EHCI driver.

The choice: Disabled, Enabled.

4.4 PCIPnP

Advanced PCI/PnP setting wrong values in below sections may cause system to malfunction.



Clear NVRAM

Clear NVRAM during System Boot.

The choice: No, Yes.

Plug & Play O/S

No: lets the BIOS configure all the devices in the system.
Yes: lets the operating system configure Plug and Play (PnP) devices not required for boot if your system has a Plug and Play operating system.

The choice: No, Yes.

PCI Latency Timer

Select value in units of PCI clocks for PCI device latency timer register.

The choice: 32, 64, 96, 128, 160, 192, 224, 248.

PCI IDE BusMaster

Enabled: Uses PCI bus mastering for reading / writing to IDE drives.

The choice: Disabled, Enabled.

OffBoard PCI/ISA IDE Card

Some PCI IDE cards may require this to be set to the PCI slot number that is holding the card. AUTO: Works for most PCI IDE cards

The choice: Auto, PCI Slot1, PCI Slot2, PCI Slot3, PCI Slot4, PCI Slot5, PCI Slot6.

IRQ 3 / IRQ 4 / IRQ5 / IRQ7 / IRQ 9 / IRQ 10 / IRQ 11 / IRQ 14 / IRQ 15

Available: Specified IRQ is available to be used by PCI/PnP devices.
Reserved: Specified IRQ is reserved for used by Legacy ISA devices.

The choice: Available, Reserved.

DMA Channel 0 / DMA Channel 1 / DMA Channel 3 / DMA Channel 5 / DMA Channel 6 / DMA Channel 7

Available: Specified DMA is available to be used by PCI/PnP devices.
Reserved: Specified DMA is reserved for use by Legacy ISA devices.

The choice: Available, Reserved.

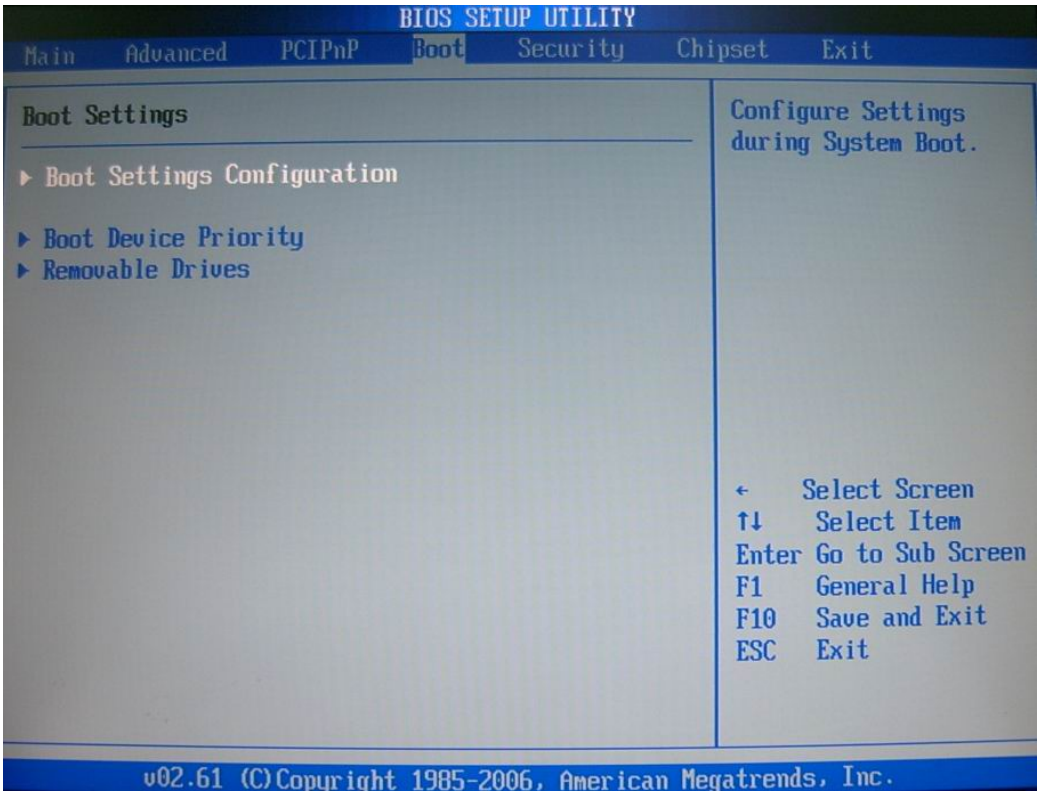
Reserved Memory Size

Select Size of memory block to reserve for legacy ISA devices.

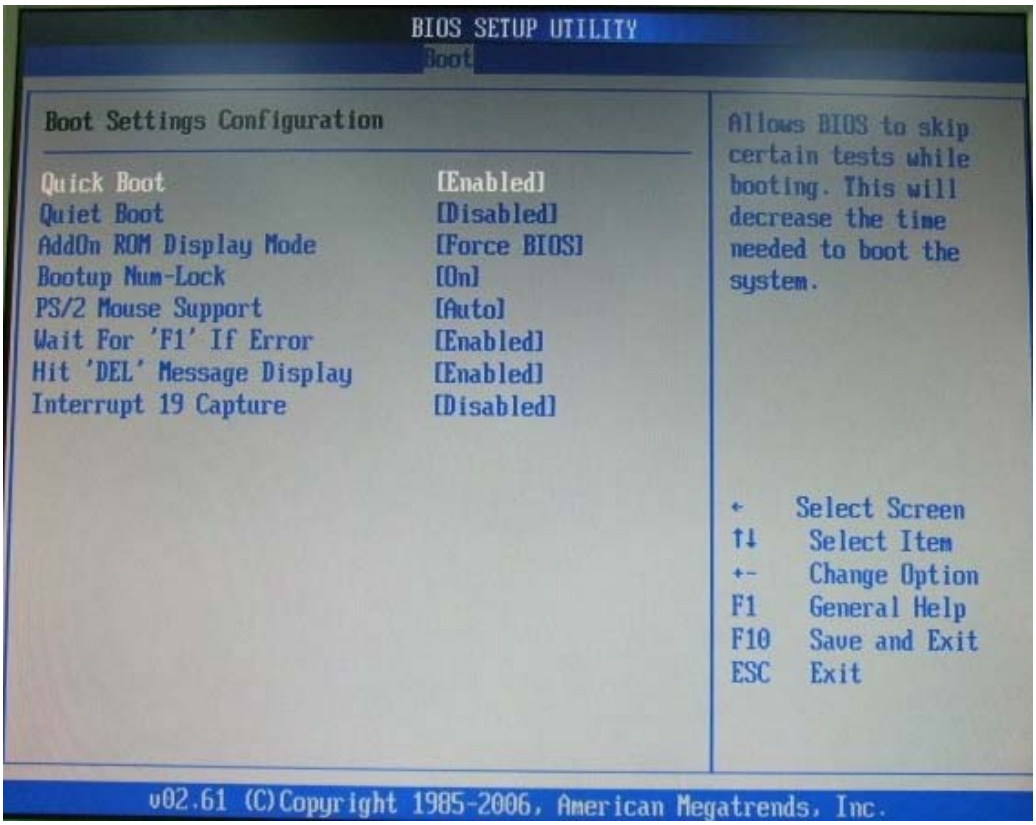
The choice: Disabled, 16K, 32K, 64K.

4.5 Boot

Use this menu to specify the priority of boot devices.



Boot Settings Configuration


BIOS SETUP UTILITY
Boot
Boot Settings Configuration
Quick Boot [Enabled]
Quiet Boot [Disabled]
AddOn ROM Display Mode [Force BIOS]
Bootup Num-Lock [On]
PS/2 Mouse Support [Auto]
Wait For 'F1' If Error [Enabled]
Hit 'DEL' Message Display [Enabled]
Interrupt 19 Capture [Disabled]
Allows BIOS to skip certain tests while booting. This will decrease the time needed to boot the system.
← Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F10 Save and Exit
ESC Exit
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Quick Boot

Enabling this setting will cause the BIOS power-on self test routine to skip some of its tests during boot up for faster system boot.

The choice: Disabled, Enabled.

Quiet Boot

This BIOS feature determines if the BIOS should hide the normal POST messages with the motherboard or system manufacturer's full-screen logo. When it is enabled, the BIOS will display the full-screen logo during the boot-up sequence, hiding normal POST messages.
When it is disabled, the BIOS will display the normal POST messages, instead of the full-screen logo.

Please note that enabling this BIOS feature often adds 2-3 seconds of delay to the booting sequence. This delay ensures that the logo is displayed for a sufficient amount of time. Therefore, it is recommended that you disable this BIOS feature for a faster boot-up time.

The choice: Disabled, Enabled.

AddOn ROM Display Mode

This item is used to determine the display mode when an optional ROM is initialized during POST. When set to [Force BIOS], the display mode used by AMI BIOS is used. Select [Keep Current] if you want to use the display mode of optional ROM.

The choice: Force BIOS, Keep Current.

Bootup Num-Lock

This setting is to set the Num Lock status when the system is powered on.
Setting to [On] will turn on the Num Lock key when the system is powered on.
Setting to [Off] will allow users to use the arrow keys on the numeric keypad.

The choice: Off, On.

PS/2 Mouse support

Select [Enabled] if you need to use a PS/2-interfaced mouse in the operating system.

The choice: Disabled, Enabled, Auto.

Wait For 'F1' If Error

When this setting is set to [Enabled] and the boot sequence encounters an error, it asks you to press F1. If disabled, the system continues to boot without waiting for you to press any keys.

The choice: Disabled, Enabled.

Hit 'DEL' Message Display

Set this option to [Disabled] to prevent the message as follows:

Hit Del if you want to run setup

It will prevent the message from appearing on the first BIOS screen when the computer boots. Set it to [Enabled] when you want to run the BIOS Setup Utility.

The choice: Disabled, Enabled.

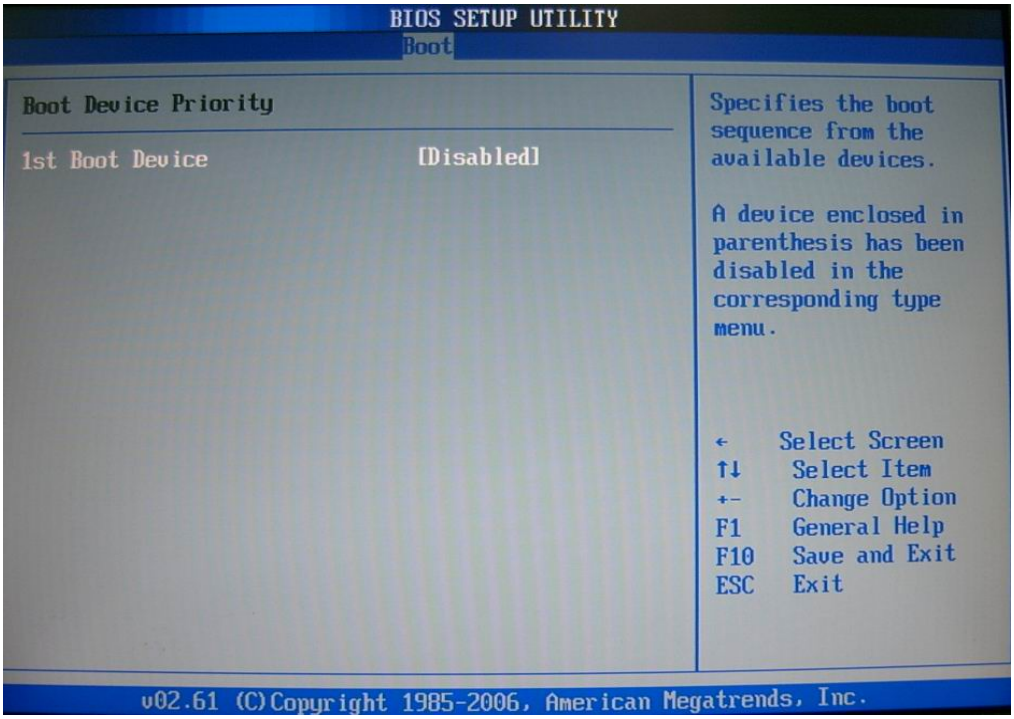
Interrupt 19 Capture

Interrupt 19 is the software interrupt that handles the boot disk function. When enabled, this BIOS feature allows the ROM BIOS of these host adaptors to "capture" Interrupt 19 during the boot process so that drives attached to these adaptors can function as bootable disks. In addition, it allows you to gain access to the host adaptor's ROM setup utility, if one is available.

When disabled, the ROM BIOS of these host adaptors will not be able to "cap ture" Interrupt 19. Therefore, you will not be able to boot operating systems from any bootable disks attached to these host adaptors. Nor will you be able to gain access to their ROM setup utilities.

The choice: Disabled, Enabled.

Boot Device Priority


BIOS SETUP UTILITY
Boot
Boot Device Priority
1st Boot Device
[Disabled]
Specifies the boot sequence from the available devices.
A device enclosed in parenthesis has been disabled in the corresponding type menu.
← Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F10 Save and Exit
ESC Exit
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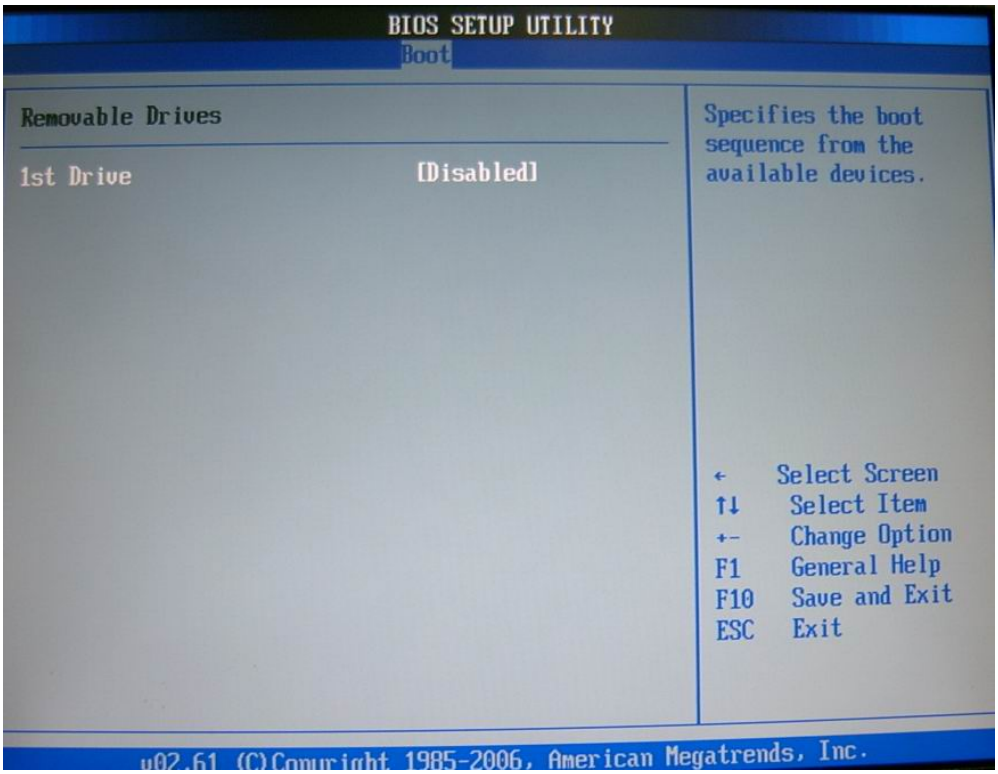
1st Boot Device

The items allow you to set the sequence of boot devices where BIOS attempts to load the disk operating system. First press <Enter> to enter the sub-menu. Then you may use the arrow keys (↑ ↓) to select the desired device, then press <+>, <—> or <PageUp>, <PageDown> key to move it up/down in the priority list.

The choice: (Network: IBA GE Slot 00C8 v1324), Disabled.

Removable Drives



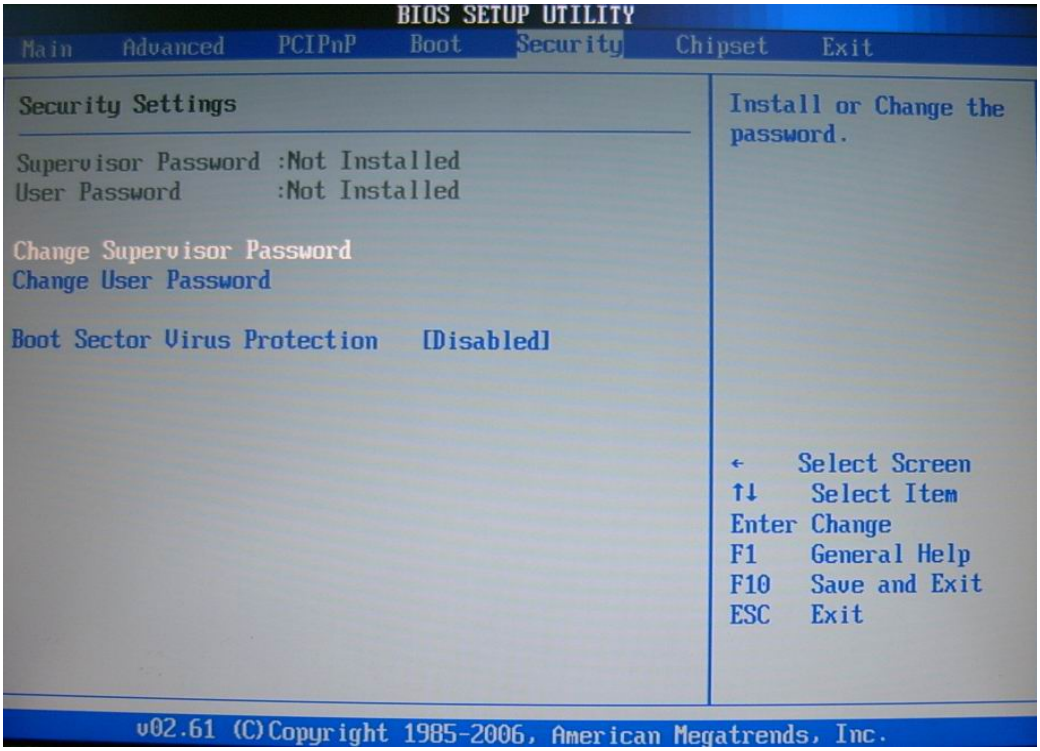
1st Drive

This setting allows users to set the priority of the removable devices. First press <Enter> to enter the sub-menu. Then you may use the arrow keys (↑ ↓) to select the desired device, then press <+>, <−> or <PageUp>, <PageDown> key to move it up/down in the priority list.

The choice: 1st FLOPPY DEVICE, Disabled.

4.6 Security

Use this menu to set supervisor and user passwords.



Supervisor Password / Change Supervisor Password

Supervisor Password controls access to the BIOS Setup utility. These settings allow you to set or change the supervisor password.

User Password / Change User Password

User Password controls access to the system at boot. These settings allow you to set or change the user password.

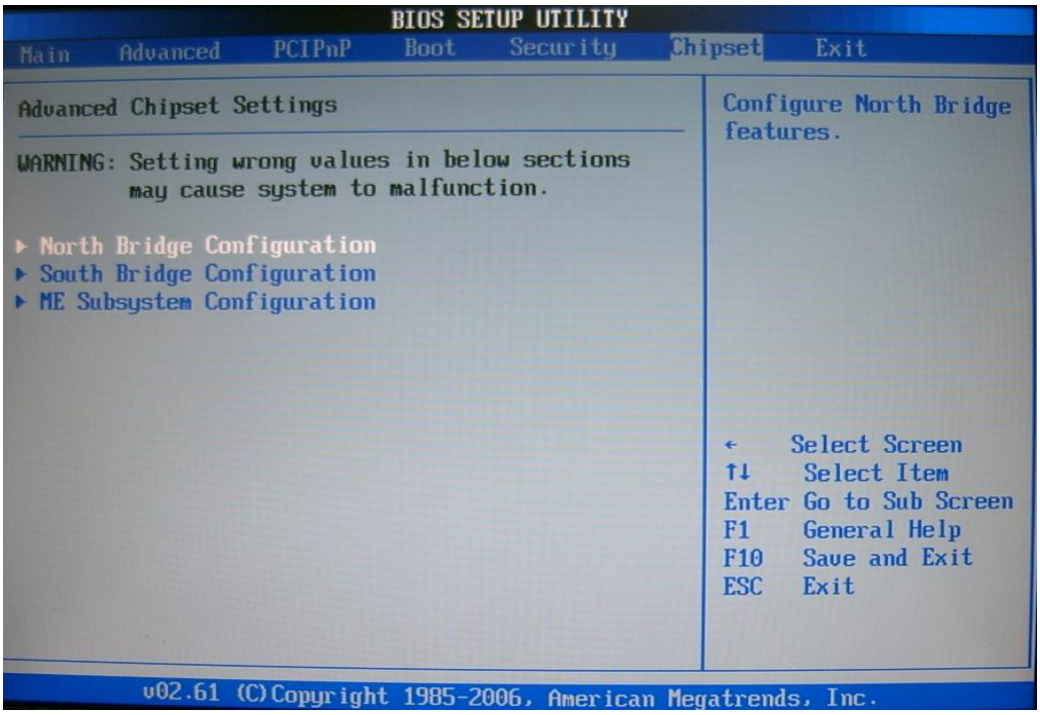
Boot Sector Virus Protection

Boot Sector Virus Protection.

The choice: Disabled, Enabled.

4.7 Chipset

This menu controls the advanced features of the onboard Northbridge and Southbridge.


BIOS SETUP UTILITY
Main Advanced PCIPnP Boot Security Chipset Exit
Advanced Chipset Settings
WARNING: Setting wrong values in below sections may cause system to malfunction.
North Bridge Configuration
South Bridge Configuration
ME Subsystem Configuration
Configure North Bridge features.
← Select Screen
↑↓ Select Item
Enter Go to Sub Screen
F1 General Help
F10 Save and Exit
ESC Exit
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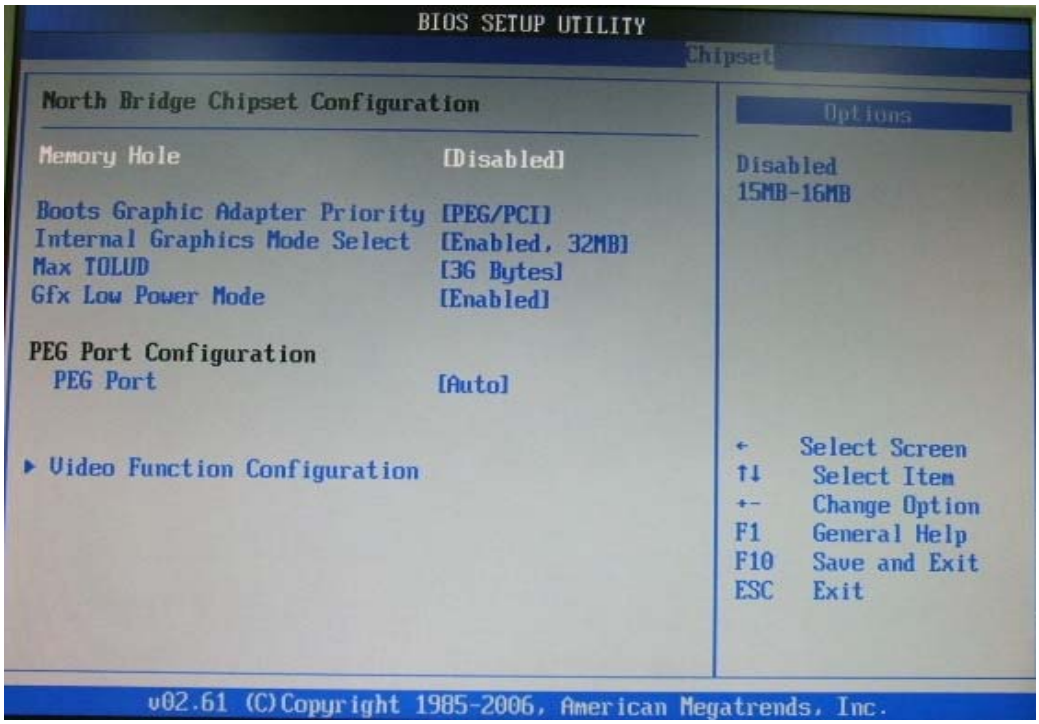
North Bridge Chipset Configuration



Memory Hole

In order to improve performance, certain space in memory is reserved for ISA cards. This memory must be mapped into the memory space below 16MB.

The choice: Disabled, 15MB-16MB.

Boots Graphic Adapter Priority

Select which graphics controller to use as the primary boot device.

The choice: IGD, PCI/IGD, PCI/PEG, PEG/IGD, PEG/PCI.

Internal Graphics Mode Select

Select the amount of system memory used by the internal graphics device.

The choice: Enabled, 32MB, Enabled, 64MB, Enabled, 128MB.

Max TOLUD

Maximum Value of TOLUD

The choice: 3G Bytes, 2.5G Bytes, 2G Bytes

GFx Low Power Mode

This option is applicable for SFF only

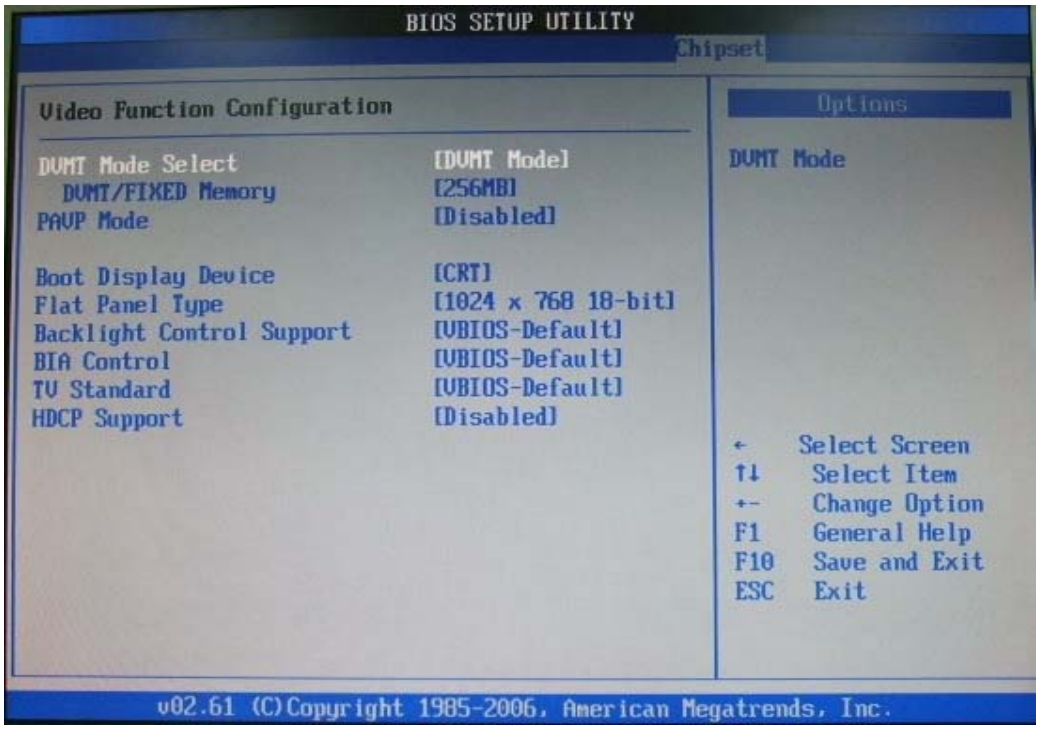
The choice: Disabled, Enabled.

PEG Port

This setting allows you to select whether to use the on-chip graphics processor or the PCI Express card. When set to [Auto], the BIOS checks to see if a PCI Express graphics card is installed. If it detects that a PCI Express graphics card is present, the motherboard boots up using that card. Otherwise, it defaults to the onboard graphics processor.

The choice: Auto, Disabled.

Video Function Configuration



DVMT Mode Select

Intel's Dynamic Video Memory Technology (DVMT) allows the system to dynamically allocate memory resources according to the demands of the system at any point in time. The key idea in DVMT is to improve the efficiency of the memory allocated to either system or graphics processor.

It is recommended that you set this BIOS feature to DVMT Mode for maximum performance. Setting it to DVMT Mode ensures that system memory is dynamically allocated for optimal balance between graphics and system performance.

The choice: Fixed Mode, DVMT Mode.

DVMT/FIXED Memory

When set to DVMT/FIXED Mode, the graphics driver will allocate a fixed amount of memory as dedicated graphics memory, as well as allow more system memory to be dynamically allocated between the graphics processor and the operating system.

The choice: 128MB, 256MB.

PAVP Mode

GMCH Protected Audio Video Path (PAVP) BIOS Support.

The choice: Disabled, Lite, High.

Boot Display Device

The choice: VBIOS-Default, CRT, TV, CRT+TV, DVI, CRT+DVI, LVDS, CRT+LVDS.

Flat Panel Type

The choice: 640x480 18 bit, 800x600 18 bit, 1024x768 18 bit, 1280x1024 18bit, 1400x1050 18 bit, 1600x1200 18bit.

Backlight Control Support

The choice: VBIOS-Default, Both BLC & BIA Disable, BLC Disabled.

BIA Control

The choice: VBIOS-Default, BIA Disabled, BIA Enabled at Level1, BIA Enabled at Level2, BIA Enabled at Level3, BIA Enabled at Level4, BIA Enabled at Level5.

TV Standard

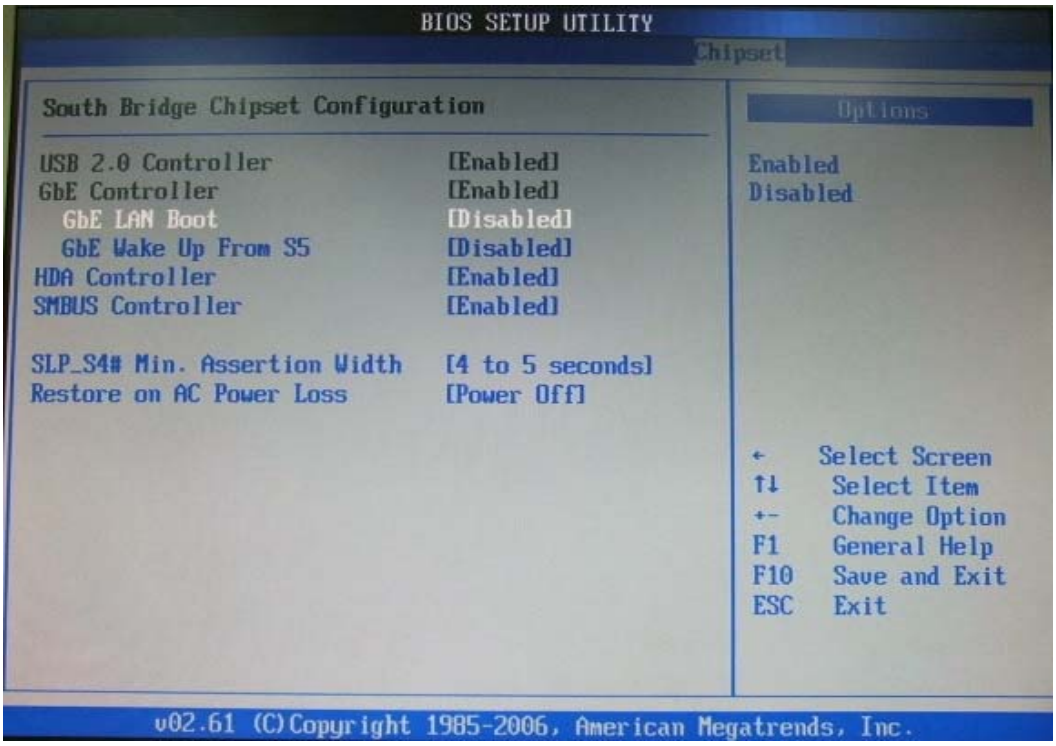
The choice: VBIOS-Default, NTSC, PAL, SECAM, SMPTE240M, ITU-R television, SMPTE295M, SMPTE296M, EIA-770.2.

HDCP Support

HDCP Provisioning BIOS

The choice: Disabled, Enabled.

South Bridge Configuration



USB 2.0 Controller

Set to [Enabled] if you need to use any USB 2.0 device in the operating system that does not support or have any USB 2.0 driver installed, such as DOS and SCO Unix.

GbE Controller

This setting Enable the onboard Gigabit Ethernet controller.

GbE LAN Boot

When [Enabled], the BIOS attempts to boot from a LAN boot image before it attempts to boot from a local storage device.

The choice: Enabled, Disabled.

GbE Wake Up From S5

This field specifies whether the system will be awakened from the S5 power saving mode when activity or input signal of onboard LAN is detected.

The choice: Enabled, Disabled.

HDA Controller

This setting controls the High Definition Audio interface integrated in the Southbridge.

The choice: Enabled, Disabled.

SMBUS Controller

The choice: Enabled, Disabled.

SLP_S4# Min. Assertion Width

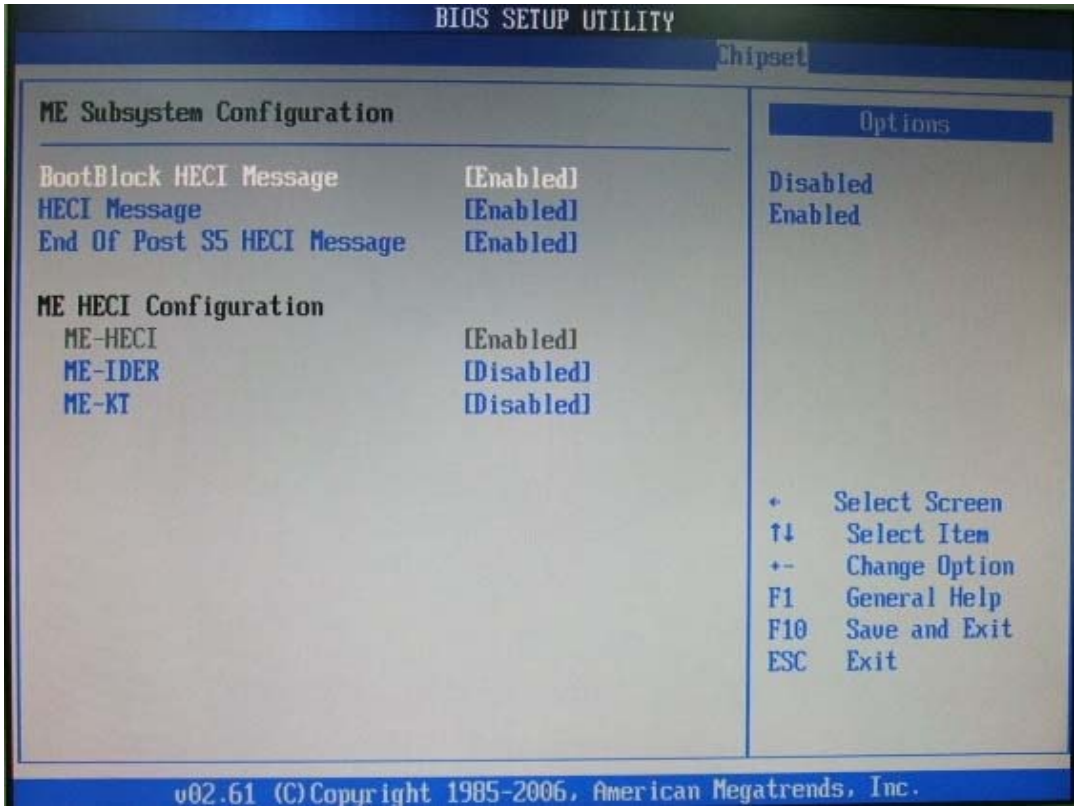
The choice: 4 to 5 seconds, 3 to 4 seconds, 2 to 3 seconds, 1 to 2 seconds.

Restore on AC Power Loss

This item allows user to configure the power status of using ATX power supply after a serious power loss occurs.

The choice: Power Off, Power On, Last State.

ME Subsystem Configuration



BootBlock HECI Message

The choice: Disabled, Enabled.

HECI Message

The choice: Disabled, Enabled.

End Of Post S5 HECI Message

The choice: Disabled, Enabled.

ME-IDER

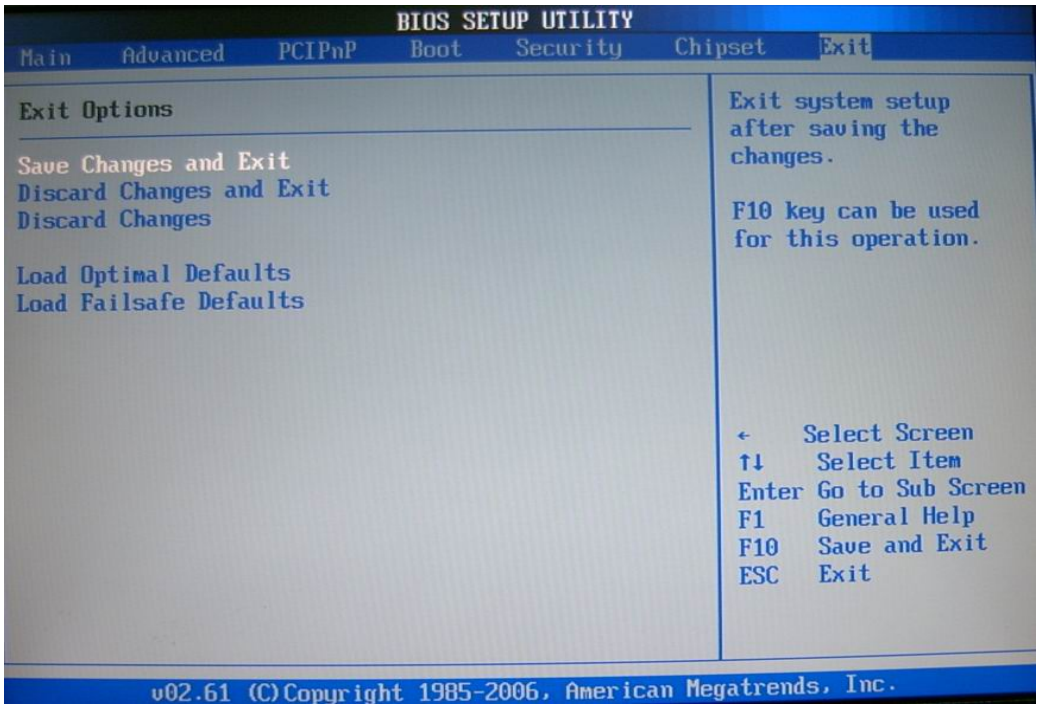
The choice: Disabled, Enabled.

ME-KT

The choice: Disabled, Enabled.

4.8 Exit

This menu allows you to load the BIOS default values or factory default settings into the BIOS and exit the BIOS setup utility with or without changes.


BIOS SETUP UTILITY
Main Advanced PCIPnP Boot Security Chipset Exit
Exit Options
Save Changes and Exit
Discard Changes and Exit
Discard Changes
Load Optimal Defaults
Load Failsafe Defaults
Exit system setup after saving the changes.
F10 key can be used for this operation.
← Select Screen
↑↓ Select Item
Enter Go to Sub Screen
F1 General Help
F10 Save and Exit
ESC Exit
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Exit Saving Changes

Exit System Setup and save your changes to CMOS. Pressing <Enter> on this item asks for confirmation: Save changes to CMOS and exit the Setup Utility.

Discard Changes and Exit

Abandon all changes and exit the Setup Utility.

Discard Changes

Abandon all changes and continue with the Setup Utility.

Load Optimal Defaults

Use this menu to load the default values set by the SBC manufacturer specifically for optimal performance of the SBC.

Load Failsafe Defaults

Use this menu to load the default values set by the BIOS vendor for stable system performance.

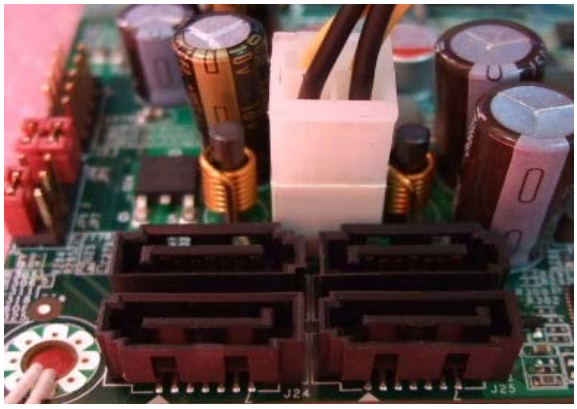
Chapter 5
Troubleshooting

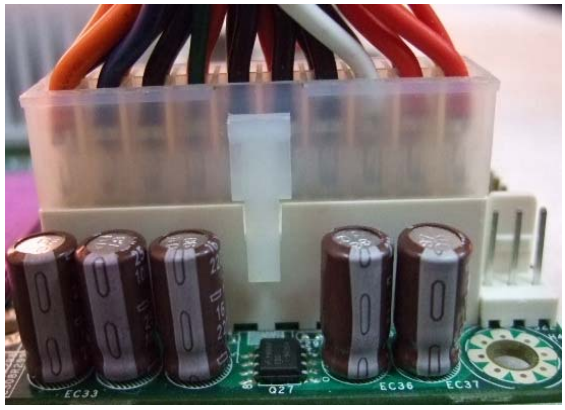
This chapter provides a few useful tips to quickly get WADE-8067 running with success. As basic hardware installation has been addressed in Chapter 2, this chapter will primarily focus on system integration issues, in terms of BIOS setting, and OS diagnostics.

5.1 Hardware Quick Installation

ATX Power Setting

Unlike other Single board computer, WADE-8067 supports ATX only. Therefore, there is no other setting that really needs to be set up. However, there are only two connectors that must be connected—J19 (4 pins CPU +12V main power connector) & J23 (20 pins ATX Power Connector) Figure.





Serial ATA Hard Disk Setting for IDE/RAID/AHCI

Unlike IDE bus, each Serial ATA channel can only connect to one SATA hard disk at a time; there are total four connectors, J20 & J21,J24 and J25. The installation of Serial ATA is simpler and easier than IDE, because SATA hard disk doesn't require setting up Master and Slave, which can reduce mistake of hardware installation. All you need to operate IDE, RAID and AHCI application for system, please follow up setting guide in BIOS programming (Table 5-1); Furthermore, you can consult chapter 4 partially of "OnChip IDE Device".

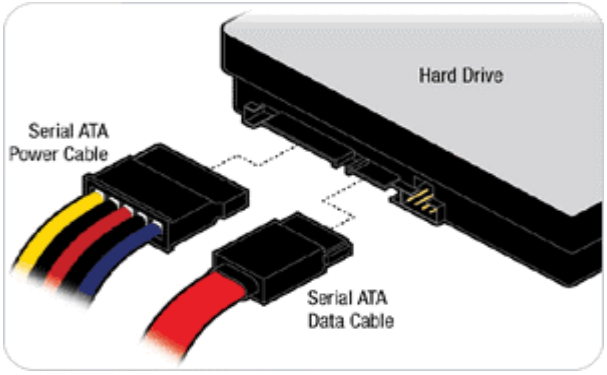


Table. 5-1 SATA Mode setting guide

System BIOS

Advanced Settings

IDE Configuration …….…… [Press enter]

Configure SATA#1 as…… [IDE/RAID/AHCI]

5.2 BIOS Setting

It is assumed that users have correctly adopted modules and connected all the devices cables required before turning on ATX power. CPU, CPU Fan, 204-pin DDR3 memory, keyboard, mouse, floppy drive, SATA hard disk, DVI-I connector, but it only can use on DVI-D function, doesn't support DVI-I function, device power cables, ATX accessories are good examples that deserve attention. With no assurance of properly and correctly accommodating these modules and devices, it is very possible to encounter system failures that result in malfunction of any device.

To make sure that you have a successful start with WADE-8067, it is recommended, when going with the boot-up sequence, to hit "DEL" key and enter the BIOS setup menu to tune up a stable BIOS configuration so that you can wake up your system far well.

Loading the default optimal setting

When prompted with the main setup menu, please scroll down to "**Load Optimal Defaults**", press "Enter" and "Y" to load in default optimal BIOS setup. This will force your BIOS setting back to the initial factory configuration. It is recommended to do this so you can be sure the system is running with the BIOS setting that Portwell has highly endorsed. As a matter of fact, users can load the default BIOS setting any time when system appears to be unstable in boot up sequence.

Auto Detect Hard Disks

In the BIOS Advanced Settings=> IDE Configuration, pick up any one from Primary IDE Master & Slave/Secondary IDE Master & Slave /Third IDE Master/Fourth IDE Master IDE ports, and press "Enter". Setup the selected IDE port and its access mode to "Auto". This will force system to automatically pick up the IDE devices that are being connected each time system boots up.

Improper disable operation

There are too many occasions where users disable a certain device/feature in one application through BIOS setting. These variables may not be set back to the original values when needed. These devices/features will certainly fail to be detected.

When the above conditions happen, it is strongly recommended to check the BIOS settings. Make sure certain items are set as they should be. These include the COM1/ COM2 ports, USB ports, external cache, on-board VGA and Ethernet.

It is also very common that users would like to disable a certain device/port to release IRQ resource. A few good examples are

Disable COM1 serial port to release IRQ #4
Disable COM2 serial port to release IRQ #3
Etc…

A quick review of the basic IRQ mapping is given below for your reference.

IRQ#	Description
IRQ #0	System Timer
IRQ #1	Keyboard Event
IRQ #2	Usable IRQ
IRQ #3	Usable IRQ
IRQ #4	COM1
IRQ #5	Usable IRQ
IRQ #6	Diskette Event
IRQ #7	Usable IRQ
IRQ #8	Real-Time Clock
IRQ #9	Usable IRQ
IRQ #10	Usable IRQ
IRQ #11	Usable IRQ
IRQ #12	IBM Mouse Event
IRQ #13	Coprocessor Error
IRQ #14	Hard Disk Event
IRQ #15	Usable IRQ

It is then very easy to find out which IRQ resource is ready for additional peripherals. If IRQ resource is not enough, please disable some devices listed above to release further IRQ numbers.

5.3 FAQ

Symptom: SBC keeps beeping, and no screen has shown.

Solution: In fact, each beep sound represents different definition of error message. Please refer to table as following:

Beep sounds	Meaning	Action
One long beep with one short beeps	DRAM error	Change DRAM or reinstall it
One long beep constantly	DRAM error	Change DRAM or reinstall it
One long beep with two short beeps	Monitor or Display Card error	Please check Monitor connector whether it inserts properly
Beep rapidly	Power error warning	Please check Power mode setting

Installation Problem

Question: How do I connect my keyboard and mouse?

Answer: Users can adopt PS/2 keyboard and mouse to connect the J7 header on WADE-8067 using cable or use the USB keyboard & Mouse.

Information & Support

Question: Intel GM45 series Chipset supports Dual Channel Mode, but how can I enable this function?

Answer: You don't have to change any setting. You can simply plug in two DDR3 SO-DIMM Modules, and then system will automatically enable Dual Channel Mode.

Question: What kind of CPU supports?

Answer: Intel Core 2 Duo Processor for Mobile and Celeron M, FSB 667/800/1066 MHz series CPU.

Question: I forget my password of system BIOS, what am I supposed to do?

Answer: You can simply short 2-3 pins on JP5 to clean your password.

Question: How can I change COM2 port to RS-232/RS-422/RS-485 mode?

Answer: You can short JP1 pin header to change RS-232/RS-422/RS-485.

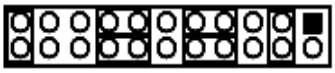
JP1 : COM2 RS232/422/485 functional selection

21 19 17 15 13 11 9 7 5 3 1

22 20 18 16 14 12 10 8 6 4 2

RS-232

21 19 17 15 13 11 9 7 5 3 1



22 20 18 16 14 12 10 8 6 4 2

RS-422

21 19 17 15 13 11 9 7 5 3 1

22 20 18 16 14 12 10 8 6 4 2

RS-485

JP1	Function
5-6,9-11,10-12,15-17,16-18 Short	RS-232 ★
3-4,7-9,8-10,13-15,14-16,21-22 Short	RS-422
1-2,7-9,8-10,19-20 Short	RS-485

Question: How to update the BIOS file of the WADE-8067?

Answer: 1. Please visit web site of the Portwell download center as below hyperlink and register an account.
http://www.portwell.com.tw/support/newmember.php
2. Input your User name and password to log in the download center.
3. Select the "Search download" to input the keyword "WADE-8067".
4. Find the "BIOS "page to download the ROM file and flash utility.
5. Execute the zip file to root of the bootable USB Pen drive.
6. Insert your bootable USB Pen drive in WADE-8067 board and power-on.
7. Input the "FPT /f XXXXX.ROM /BIOS" to start to update BIOS. ("XXXXX" is the file name of the ROM file.)
8. Switch "Off" the Power Supply when you finished the update process.
9. To short the JP5 jumper from 1-2 short to 2-3 short 5 seconds then set back to 1-2 short. (Clear CMOS)
10. Switch "ON" the Power Supply then press the "del" key to BIOS to load "Failsafe defaults" and "Optimal defaults" then save them to exit.

Note:
Please visit our technical web site at
http://www.portwell.com.tw
For additional technical information, which is not covered in this manual, you can mail to tsd@mail.portwell.com.tw or you can also send mail to our sales, they will be very delighted to forward them to us.

System Memory Address Map

Each On-board device in the system is assigned a set of memory addresses, which also can be identical of the device. The following table lists the system memory address used for your reference.

Memory Area	Size	Device Description
0000-003F	1K	Interrupt Area
0040-004F	0.3K	BIOS Data Area
0050-006F	0.5K	System Data
0070-0E2E	54K	DOS
0E2F-0F6B	5K	Program Area
0F6C-97FF	546K	[Available]
First Meg	-- Conventional memory end at 608K --	
9800-983F	1K	Extended BIOS Area
9840-9FFF	31K	Unused
A000-AFFF	64K	VGA Graphics
B000-B7FF	32K	Unused
B800-BFFF	32K	VGA Text
C000-CF9F	62K	Video ROM
CFA0-EFFF	129K	Unused
F000-FFFF	64K	System ROM

Interrupt Request Lines (IRQ)

Peripheral devices can use interrupt request lines to notify CPU for the service required. The following table shows the IRQ used by the devices on board.

IRQ#	Current Use	Default Use
IRQ 0	System ROM	System Timer
IRQ 1	System ROM	Keyboard Event
IRQ 2	[Unassigned]	Usable IRQ
IRQ 3	System ROM	Usable IRQ
IRQ 4	System ROM	COM1
IRQ 5	[Unassigned]	Usable IRQ
IRQ 6	System ROM	Diskette Event
IRQ 7	[Unassigned]	Usable IRQ
IRQ 8	System ROM	Real-Time Clock
IRQ 9	[Unassigned]	Usable IRQ
IRQ 10	[Unassigned]	Usable IRQ
IRQ 11	[Unassigned]	Usable IRQ
IRQ 12	System ROM	IBM Mouse Event
IRQ 13	System ROM	Coprocessor Error
IRQ 14	System ROM	Hard Disk Event
IRQ 15	[Unassigned]	Usable IRQ